FATE OF LIMESTONE DISSOLUTION PRODUCTS IN ACIDIC METAL-CONTAMINATED SOIL MESOCOSMS

By

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Abstract

The impact of liming (10 t ha^{-1} of calcitic and dolomitic limestone, separately) on the soil solution and soil matrix was investigated in an acidic metal-contaminated soil from Sudbury, ON. A soil mesocosm experiment was performed; columns were leached with simulated rainwater and the soil solution collected at various locations throughout the soil column. The dissolution rate of calcitic limestone used for this experiment was found to be approximately double that of the dolomitic limestone investigated. Calcium and Mg released during limestone dissolution migrated through the soil profile to the Bf-BC interface. The addition of limestone increased the pH and decreases the bioavailability of Ni, Cu, Co, Cd, As, Ba, Mn, and Zn the LFH horizon. Amending acid, contaminated soils with calcitic or dolomitic limestone has profound effects on soil solution chemistry.

Keywords

Calcitic limestone, dolomitic limestone, acidic metal-contaminated soils, Sudbury, limestone dissolution rate, bioavailable metals, soil chemistry.

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Chapter 1

1 Introduction

1.1 Environmental pollution and reclamation in the Greater Sudbury area

The City of Greater Sudbury, ON, has a long history of mining, smelting, and environmental damage. Before mining began, intense logging and frequent forest fires contributed to Sudbury's ecological damage (Winterhalder, 1995), but the main contributing factor was mining and smelting related activities. Rich Ni-Cu deposits were discovered in Sudbury in 1883. These ores contained not only Ni and Cu, but also Au, Ag, Co, Se, Te, and platinum group metals; the ore also had very high sulphur content (8:1 S:Ni) (Gunn, 1996). Until 1929, open roast beds were used to ignite the ore to burn off the sulphur, releasing sulphur dioxide and large quantities of metal contaminated dust into the atmosphere (Watson, et al., 2012). From 1913 to 1972, three major smelting centers were in use to process the ore in the Greater Sudbury area: Copper Cliff, Coniston, and Falconbridge (Gunn, 1996). In peak production, the three smelting operations were emitting approximately 2.5 million tons of sulphur dioxide annually (Gunn, 1996). In total, over 100 million tons of sulphur dioxide and tens of thousands of tons of metal particulates were released into the atmosphere by the Sudbury smelter operations (Gunn, 1996; Wren, 2012). Sulphur dioxide and metal particulate emissions caused wide scale vegetation death, severe soil erosion, and severe contamination of surface soils, water, and lake sediments. Three barren areas totaling approximately 17 000 hectares around the smelters, and an additional 81 000 hectares of semi-barren land were created (Figure 1). Barren lands were almost completely devoid of vegetation, and semi-barren lands consisted of a near monoculture of stunted white birch (Amiro & Courtin, 1981). Since 1960, emissions of sulphur dioxide and metal particulates have been reduced drastically (Potvin & Negusanti, 1996), and continue to drop (Watson, et al., 2012); however, the damage to the landscape was so severe that a drop in emissions alone could not restore the Sudbury ecosystem into a stable, functioning, quasi-natural biotic community (Winterhalder, 1995). This signaled the need for a large scale remediation program.

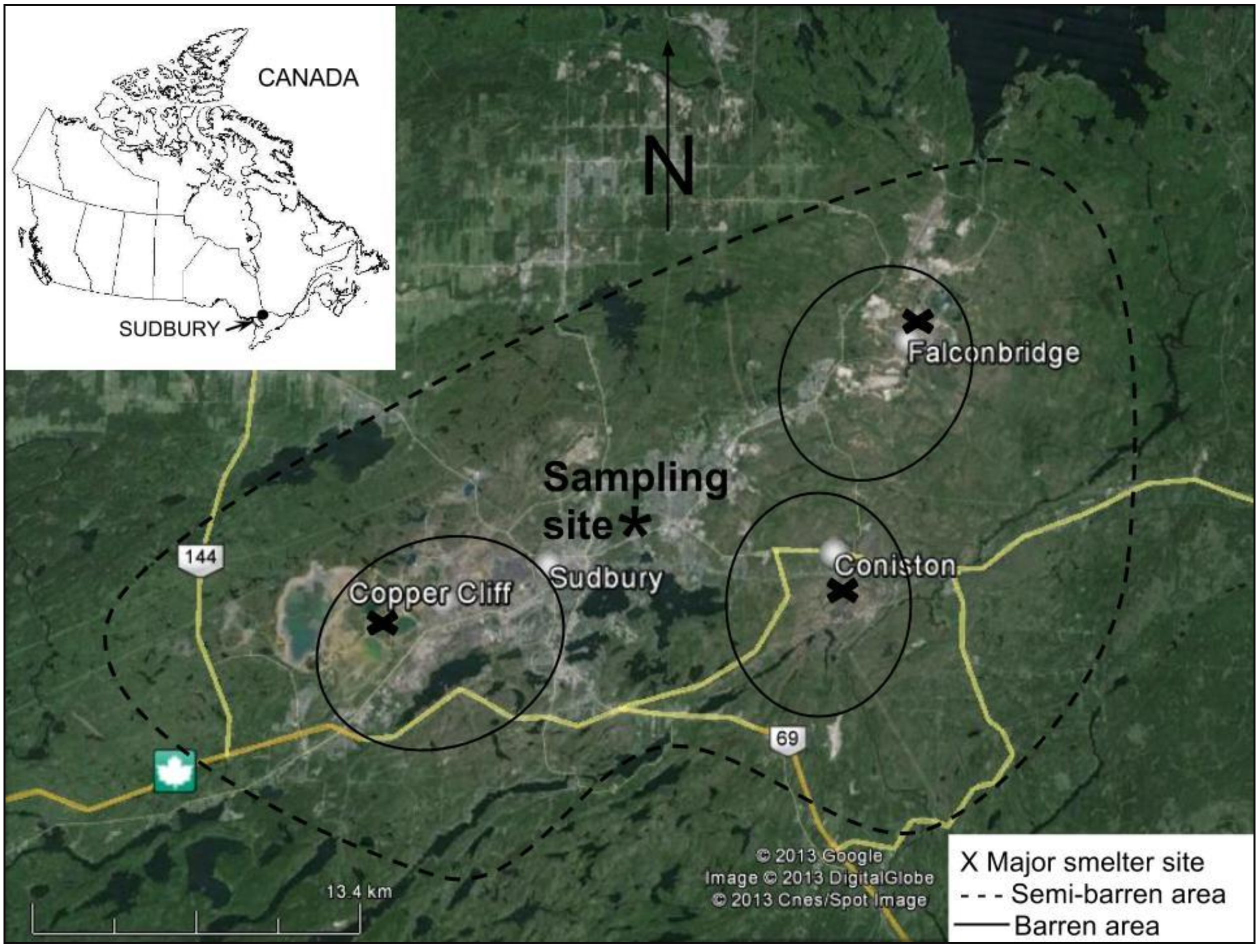

Figure 1: Approximate location of major forest damage in the Sudbury area and sampling site. Adapted from Gunn (1996). Image from Google Earth 2013.

As smelter emissions began to decrease, scientists, government, industry, and the public came together to implement a regional re-greening program with the aim to reclaim the damaged Sudbury ecosystem. A technical advisory committee was formed in 1974 to advise elected members of the regional council on how to restore the land (Lautenbach, et al., 1995). The large scale reclamation program began in 1978 (Lautenbach, et al., 1995). Due to the low pH of the soils and high Cu, Ni, and Al in both barren and semi-barren sites (Hutchinson & Whitby, 1974), liming the soil was required to detoxify metals and raise soil pH in surface horizons (Winterhalder, 1983). A reclamation recipe with four steps was developed; (1) apply 10 tonnes/ha of dolomite (manually) to raise pH to above 5, (2) apply fertilizer, 6N-24P-24K at a rate of 390-400kg/ha several weeks after liming, (3) apply a seed mixture of several grasses and two legumes at a rate of 30-50kg/ha in mid-late August, and (4) plant trees and shrubs 1-2 years after initial liming (Lautenbach, et al., 1995). The re-greening program proved to be a great success, with over 3400 hectares of land limed and seeded and over 9 million trees planted (VETAC, 2012). The re-greening program has also won multiple national and international awards, and the reclamation efforts are ongoing with plans to continue liming, seeding, and tree planting (VETAC, 2010). The focus of the re-greening efforts has evolved to include an emphasis on biodiversity in the Sudbury plant and wildlife habitats. (VETAC, 2010). Ongoing monitoring of pH and both total and bioavailable metal concentrations in the Sudbury soils is necessary to assess the ecological recovery developed and implemented in the region (Wren, 2012). The 2001 Sudbury Regional Soils Study demonstrated that concentrations of anthropogenic metals remain high (Wren, 2012). Metal(loid)s As, Co Cu, Ni, Pb, Se, and Cd were classified as chemicals of concern for Sudbury soils due to their high concentrations across the study area in soils with low pH (<5) (Spiers, et al., 2012). The majority of the anthropogenic metal and metalloid contamination in undisturbed soils was found to be isolated to the top 5cm of the soil, referred to as the zone of accumulation (Wren, 2012). Areas that have been limed still contain high concentrations of these metals (Nkongolo, et al., 2013); therefore, the potential for these metals to become mobile is always present.

1.2 Limestone as a reclamation amendment for soils

The ultimate goal of any reclamation or remediation project is to limit the dispersal of contaminants to the environment (humans and biota). When an amendment is added directly to contaminated soil (i.e., the soil is not being transported as waste and the contaminants are not physically removed), the reclamation approach is called *in situ* treatment (O'Day & Vlassoloulos, 2010). *In situ* treatment costs much less than *ex situ* processes and can therefore be applied over large areas where the original contamination was not contained, as in the Sudbury case. As described above, the Sudbury reclamation program involved the addition of agricultural grade dolomitic limestone onto metal contaminated acid soils in the region.

Limestone has been used in agricultural setting since as early as 1700 (Harcourt, et al., 1925). In agriculture, liming is used to increase crop productivity by increasing soil root zone pH, decrease metal toxicity, and increase nutrient availability (Kowalenko & Ihnat, 2013). When limestone is applied to remediate contaminated soil, the positive effects of liming are identical. Limestone is often added to metal contaminated, acid soils in an effort to: (1) decrease the bioavailability of metals like Cu and Ni; (2) reduce the toxicity of Al; (3) increase availability of soil nutrients, and; (4) enhance vegetation growth. All these effects can be linked to increase in soil pH and the addition of Mg and/or Ca to the soil (Winterhalder, 1995). Increasing the soil pH immobilizes metals like Cu, Ni, Cd and Pb by enhancing the simple adsorption to oxides, organic matter, and silicate oxides (O'Day & Vlassoloulos, 2010). Contaminant metal cations can form inner-sphere complexes with soil organic matter and soil clay mineral surfaces, reducing the mobility and phytoavailability of the metals, as long as the pH remains elevated above a certain threshold (O'Day & Vlassoloulos, 2010). A more detailed description of how limestone 'detoxifies' soils and affects soil chemistry is described below. In *in situ* treatment of soils, the contaminants are always present, but maintained in an unavailable form. Therefore there is always a risk that future changes to the soil chemistry could induce desorption of contaminants, rendering them available. Thus the long term monitoring of defined limed sites, especially those which are not contained (like the soil around the Sudbury area) is extremely important.

Limestone used for remediation has varying amounts of Mg contained in the carbonate minerals of the sedimentary rock, with calcite ($CaCO_3$) containing little to no Mg, magnesian calcite ($(Ca,Mg(CO_3)_2)$) containing up to 24 wt% Mg, dolomite ($(CaMg(CO_3)_2)$) containing around 12 wt% Mg, and magnesite ($MgCO_3$) containing mostly Mg (O'Day & Vlassoloulos, 2010). Most reclamation studies on metal contaminated acid soil, use calcite, dolomite, or a Ca-limestone with varying amounts of Mg (<12 wt%). The limestone used, especially for larger scale field studies, is usually not pure carbonate minerals but rather agricultural-grade granular limestone that contains some non-carbonate mineral material, generally quartz (SiO_2). For application as a soil amendment, the limestone is crushed to various particle sizes. The size distribution of limestone material, as well as the Ca, Mg, carbonate content, and non-carbonate components all affect limestone dissolution activity, and how the limestone dissolution products will react with the soil matrix and solution phases. The limestone used initially for the Sudbury reclamation program was a granular dolomite (Lautenbach, et al., 1995). The present study compares the behaviour of two types of limestone, a calcitic limestone and a dolomitic limestone.

1.2.1 Dissolution of limestone

The dissolution of limestone in soil is an important factor from a reclamation perspective, determining the rate at which Ca^{2+}, Mg^{2+}, HCO_3^-, and OH^- ions are added to the soil. The general equation which describes the dissolution of limestone is as follows (example showing dolomite):

$$CaMg(CO_3)_2 + 2H_2O \leftrightarrow Ca^{2+} + Mg^{2+} + 2HCO_3^- + 2OH^- \quad (1)$$

Liming materials are commonly added to areas containing acidic soils as reclamation amendments. Many of these areas still have some degree of acid rain (caused by anthropogenic processes) and certainly have H^+ and Al^{3+} species present in the soil solution. Therefore the dissolution of limestone will be described in the context of acid rain and acidic soil solution.

The dissolution of calcite and release of Ca (and presumably Ca and Mg from dolomite) under acid rain conditions can be described by karstic dissolution, dry deposition (dissolution caused by gaseous pollutant reactions) and wet deposition of pollutants (acid rain) (Cardell-Fernandez, et al., 2002). Dry deposition can be a large contributor to calcite dissolution (Cardell-Fernandez, et al., 2002), but will not be discussed further because the present study was performed in a laboratory setting with no atmospheric pollution. The karst effect is the natural dissolution of limestone by rainwater which has not been acidified with mineral acids. Karst dissolution can be described by three equations (Cardell-Fernandez, et al., 2002):

$$CaCO_3 + H_2O + CO_2 \leftrightarrow Ca(HCO_3)_2 \quad (2)$$

$$H^+ + HCO_3{}^- \leftrightarrow H_2CO_3 \quad (3)$$

$$H_2CO_3 \leftrightarrow H_2O + CO_2 \uparrow \quad (4)$$

During the reaction in eq. 2, calcium bicarbonate is formed. As calcium bicarbonate is much more soluble than calcium carbonate, the calcium bicarbonate will dissolve and the bicarbonate ion can react with protons to form carbonic acid (eq. 3). The carbonic acid can then undergo CO_2 liberation to restore the carbonate equilibrium (eq. 4). The dissolution of limestone due to the karst effect increases the pH of the solution (Cardell-Fernandez, et al., 2002). Karstification is generally weaker in dolomite than in limestone rocks, reflecting the slower dissolution rate for dolomite compared to calcite (Lui, et al., 2005). Wet deposition of acid rain causes a neutralization reaction at the surface of the carbonate to occur (Cardell-Fernandez, et al., 2002):

$$CaCO_3 + 2H^+ + SO_4{}^{2-} \leftrightarrow Ca^{2+} + H_2O + CO_2 \uparrow + SO_4{}^{2-} \tag{5}$$

The concentration of SO_4^{2-} is unchanged, but the increase in pH is caused by the decrease in bicarbonate in the system. These dissolution mechanisms explain the interactions between rainwater and the limestone, but not between the limestone and other constituents in the soil solution.

When lime is added to the soil a series of other reactions between the limestone and other constituents in the soil can occur. In acid soils with excess protons, the limestone can undergo a direct dissolution reaction (Warfvinge & Sverdrup, 1988):

$$CaCO_3 + H^+ \leftrightarrow Ca^{2+} + HCO_3{}^- \tag{6}$$

The Ca^{2+} ions released can then react with the soil exchange complex and undergo a cation exchange reaction (Warfvinge & Sverdrup, 1988):

$$2R - H + Ca^{2+} \leftrightarrow 2R - Ca_{1/2} + 2H^+ \tag{7}$$

To form the overall reaction:

$$CaCO_3 + 2R - H \leftrightarrow 2R - Ca_{1/2} + HCO_3{}^- + H^+ \tag{8}$$

These reactions are favored when there is a large amount of protons on the exchange complex available for exchange, and also when the soil solution pH is below 5.5 (Warfvinge & Sverdrup, 1988). The dissolution of limestone and the reaction of the dissolution products with the exchange complex must be thought of as two separate reactions because they do not occur simultaneously or at the same rate. The equations describing Ca^{2+} release during calcite dissolution and reaction with the exchange complex can also be applied to Ca^{2+} and Mg^{2+} in dolomite amended columns. The soil exchange complex consists of colloidal organic matter, clay minerals, and Fe/Al oxides which can adsorb cations and anions which can, in turn, be readily exchanged with other cations and anions in the bulk soil solution (White, 2006). Cation exchange capacity is the sum of exchangeable base cations and exchangeable acidity in the soil (Ross, et al., 2008). In acid soils which are depleted in nutrients (such as the Sudbury barren and semi-barren soils (Winterhalder, 1995), the dissolution of limestone adds Ca and Mg to the soil exchange complex.

The size distribution of the limestone added to the soil has a large impact on dissolution rate. The limestone used for the Sudbury re-greening program was granular dolomite, which contained a wide size range of particles (Lautenbach, et al., 1995). Research shows that the very fine particles of the limestone will dissolve quickly; however, after the initial dissolution of fine particles, the equal diameter reduction model takes over (Elphrick, 1955). The equal diameter reduction model assumes that the mixture of unequal sized particles of limestone behave collectively as equal size spheres (Elphrick, 1955; Swartzendruber & Barber, 1965). Or simply put, as the larger particles dissolve, their size is reduced and the surface area increases and the larger particles become the finer particles over time, making the cumulative mass distribution linear between the smallest particles and the largest particle (Swartzendruber & Barber, 1965).

The dissolution of calcite is much faster than dolomite under a variety of experimental conditions (Lui, et al., 2005; Morse & Arvidson, 2002), a result of different rate-determining mechanisms for calcite and dolomite dissolution (Lui, et al., 2005). The dissolution of dolomite is slower compared to calcite due to more complicated surface reaction controlling mechanisms (Lui, et al., 2005). Karstification processes are also weaker in dolomite compared to calcite (Lui, et al., 2005) . Thus one can hypothesize that, provided both limestone samples have the same particle size distribution, calcite will have a faster dissolution rate than dolomite in the present study.

1.2.2 Movement of limestone dissolution products through soil

The movement of limestone dissolution products (Ca^{2+}, Mg^{2+}, and HCO_3^-) through the soil is often overlooked in reclamation studies, with a focus on the change in soil pH and the reduction in the availability of contaminant ions. Once the limestone dissolution products enter the soil solution system they can undergo a variety of chemical reactions with both the soil solution and solid phase. The nature of the interaction of the Ca and Mg ions with the exchange complex in the top of the soil where they are deposited will influence the distance of their migration through the soil column (or profile). Liming of acid contaminated soil is often undertaken in an effort to provide a temporary source of nutrients (e.g. Ca, Mg, and fertilizers if added) which will enable vegetation to grow and survive while increasing microbial activity and nutrient mineralization (Derome, 2000). Limestone also greatly increases the buffering capacity of the soil and increases the pH of acid soils by direct dissolution with H^+ species (eq. 6) and the release of bicarbonate and hydroxide species during dissolution with water (eq. 1). Excess protons will continue to be buffered as long as limestone particles continue to dissolve (Huang, 2000). Large scale reclamation projects which add limestone as an amendment to polluted forested ecosystems in Canada (Winterhalder, 1995), Finland (Derome, 2000), Poland (Mleczek, et al., 2012) , Belgium (Duliere, et al., 1999), Sweden (Lundell, et al., 2001), and Russia (Eranen & Kozlov, 2006), aim to only apply limestone once to promote the establishment of a functioning ecosystem even after the lime is dissolved. Once a functioning forest ecosystem is established, base cations should continue to be cycled by tree roots which facilitate movement of Ca^{2+} and Mg^{2+} ions from deeper soil to the surface by mechanisms described by Aber (1987) as a cation pump (Winterhalder, 1995). Once all the limestone is dissolved, the soil buffering system must rely on soil organic matter, silicate clays, and oxyhydroxides of Fe and Al to maintain a favorable pH (Huang, 2000).

Monitoring of how the Ca^{2+} and Mg^{2+} ions released from limestone dissolution migrate through the soil system, gives insight into whether they are being lost to the system or are effectively being retained and recycled through the “cation pump” mechanism (Aber, 1987). Previous studies of the movement of Ca^{2+} and Mg^{2+} ions in solution after liming have found increased levels of both cations as far down as 30cm, namely within the mineral horizons of a forested soil (Derome & Saarsalmi, 1999; Lundell, et al., 2001). An increase in Ca and Mg in the soils solution at depths of 20 and 30cm does not mean the cations are being leached out of the soil-plant system; roots may penetrate that far and have the ability to pump the cations back to the surface (Aber, 1987). Liming has also been found to increase the bioavailable concentrations of Ca and Mg, but this is mostly limited to the top organic horizon of the soil (Derome, 2000; Nkongolo, et al., 2013). Bioavailable concentrations of Ca and Mg remain elevated in Sudbury soils even 30 years after liming (Nkongolo, et al., 2013). The longer the limestone can provide Ca, Mg, and maintain the buffering capacity to the soil, the longer the forest ecosystem has to develop a stable, functioning environment, where future additions of liming materials will not be required. The addition of Ca and Mg to the soil system to restore nutrient balance is only one aspect of liming. Limestone additions also increase the soil pH which, in turn, helps to reduce the bioavailability of contaminant metals and Al, which would otherwise hinder microbial activity and vegetation growth (Winterhalder, 1995).

1.2.3 Effect of limestone dissolution on contaminant metals

In the Sudbury Soil Study (SSS) the contaminant metals identified as the Chemicals of Concern (COC) are As, Co, Cu. Ni, Pb, Se, and Cd (Spiers, et al., 2012). Elevated concentrations of these metals are found throughout Sudbury soils in both limed and unlimed areas (Spiers, et al., 2012; Nkongolo, et al., 2013). Much emphasis has been placed on Ni and Cu concentrations in Sudbury soils because they are often found to have total concentrations over 1000 mg/kg, and associated bioavailable concentrations as high as 100 mg/kg (Hutchinson & Whitby, 1974; Dunka, et al., 1995; Wren, 2012; Wren, et al., 2012; Abedin & Spiers, 2006). Liming has been found to decrease the mobility, and thus bioavailability, of metals in soil (e.g. Cu, Ni, Co, Cd, Pb, Zn, Al, and Fe: Nkongolo, et al., 2013; Derome & Saarsalmi, 1999; Levonmaki & Hartikainen, 2007; Kukier & Chaney, 2000). Liming does not cause a reduction in the total concentration of contaminant metals in the soil, but rather decreases their bioavailability and concentration in the soil solution. This reduction in mobility is closely associated with an increase in soil pH. Most metals, such as Cu, Ni, Co, and Pb, bond with the soil differently than alkali/alkaline earth metals. Alkali/alkaline earth metals are largely adsorbed by weak electrostatic forces to the soil as exchangeable hydrated ions onto carboxyl groups of organic matter and clay materials (Young, 2013). In contrast, as the pH increases, heavy metal ions are strongly and specifically adsorbed onto exposed oxy-acid groups on humus and can form inner-sphere complexes with hydrous oxide surfaces (Young, 2013). An example of how these complexes can form is represented in the equation below (Young, 2013):

$$ExCu^{2+} + CaCO_3 + [OM - (COOH)_2] \leftrightarrow ExCa^{2+} + [OM - (COO)_2 = Cu] + CO_2 + H_2O \qquad (9)$$

Calcium ions displace Cu ions from the soil exchange complex (*Ex*) into solution, but the increased negative surface charge on organic matter (*OM*) caused by the increase in pH (due to hydroxyl and bicarbonate anions released during limestone dissolution) promotes specific adsorption of Cu^{2+} ions with the soil organic matter, thus immobilizing the ion. These adsorbed complexes are less mobile, thus decreasing the bioavailability and toxicity of metals such as Cu and Ni with the increase in soil solution pH. An increase in pH can also cause decreased Al toxicity by the precipitation of amorphous $Al(OH)_3$. Aluminum can add large amounts of acidity to the soil due to the hydrolysis of water with Al^{3+} which causes the release of H^+ (Huang, 2000). However, once the soil solution is increased to over 5.5, $Al(OH)_3$ is formed and its solubility is low (Huang, 2000). Metals like Cu, Ni, Pb, and Zn can also form hydroxide precipitates at high pH, although this is less common in soil as the metals are usually immobilized as described above (Young, 2013). Careful management of the soil system is important to ensure that not all the 'heavy' metals are precipitated at increased pH levels because metals such as Cu, Mn and Zn are essential plant micronutrients (White, 2006).

The processes governing the mobility of As and Se in contaminated soils when limestone is added are different because of the chemical nature of these metalloids in the soil. Arsenic and Se are both present as oxyanions in the soil solution, and therefore are more soluble at higher pH and are strongly absorbed to Fe oxides at low pH (Fe oxides are positively charged at low pH) (Miller & Miller, 2000; Young, 2013). Although As and Se are both chemicals of concern for the Sudbury soils (Spiers, et al., 2012), their mobility in limed soils has not been thoroughly investigated.

Liming soils with high concentrations of contaminant metals (like Cu and Ni) and acidity components (like H^+ and Al^{3+}) present on the soil exchange complex can lead to short term increases in acidity and metal solubility (Derome & Saarsalmi, 1999; Nohrstedt, 1992). The most likely mechanism driving the release of metals, H^+, and Al^{3+} from the exchange complex is the increased amounts of Mg^{2+} and/or Ca^{2+} released during limestone dissolution which exchange Ni, Cu, H^+, and Al ions present on the soil exchange complex (Warfvinge & Sverdrup, 1988). Increased release of metals (Cu, Ni) has been shown to occur when the organic layer of a contaminated soil is over limed (Derome & Saarsalmi, 1999), whereas decreases in pH associated with increased leaching of H^+ and Al^{3+} has been demonstrated in soils which have low lime doses (Nohrstedt, 1992).

Although many studies (mentioned above) show an increase in soil pH due to liming, other studies show little change in pH with liming even if there is a slight decrease in available contaminants such as Cu, Ni, and an increased concentration of Ca^{2+} and Mg^{2+} (Derome, 2000; Nohrstedt, 1992). When limestone (both calcite and dolomite) undergoes dissolution, hydroxide and bicarbonate species are released (eq. 1). When the concentrations of Fe^{3+} and other metal ions (Cu^{2+}, Ni^{2+}, and Zn^{2+}) are very high, they can react directly with the hydroxide and bicarbonate ions and be precipitated (Derome, 2000):

$$Fe^{3+} + HCO_3^{\ -} + 2OH^- \leftrightarrow Fe(OH)_3 \downarrow + CO_2 \uparrow \qquad (10)$$

$$Ni^{2+} + HCO_3^{\ -} + OH^- \leftrightarrow Ni(OH)_2 \downarrow + CO_2 \uparrow \qquad (11)$$

This precipitation reaction causes Ca and Mg ions to be released to the soil solution, but also uses up a considerable proportion of the neutralising capacity of the limestone (Derome, 2000). Although many of the Sudbury soils which have been limed still show elevated pH levels in the organic horizon, some soils do not (Nkongolo, et al., 2013; Juckers, et al., 2013). The precipitation of $Fe(OH)_3$ may be one contributing factor explaining why some limed areas show less of a pH increase than others following the application of liming materials.

Aluminum hydrolysis may also play a role in the pH equilibria of limed acid soils that contain a high concentration of exchangeable Al (such as the Sudbury soils). When high concentrations of soluble Al^{3+} are present in the soil, the Al^{3+} can buffer the solution pH via hydrolysis reactions with added carbonate materials:

$$Al^{3+} + CaCO_3 + 2\,H_2O \leftrightarrow Al(OH)_2^{\ +} + Ca^{2+} + H_2CO_3 \qquad (12)$$

The hydroxyl-Al and Ca cations would then be preferentially adsorbed on organic matter exchange sites, causing the displacement of H^+ ions bound to the exchange complex, into solution:

$$3R - H^+ + Al(OH)_2^{\ +} + Ca^{2+} \leftrightarrow R - Al(OH)_2 + R - Ca + 3H^+ \qquad (13)$$

This type of reaction would increase the proton acidity in the solution phase as well as increase the concentration of Ca and Al on the soil exchange complex, leading to an increase in soil exchangeable Ca but not an increase in pH. This type of Al hydrolysis may also explain the increase in pH observed in some soils which have been insufficiently limed (as discussed above) (Nohrstedt, 1992).

1.2.4 Effect of limestone dissolution on nutrients and non metals

Soils which have been heavily contaminated are often devoid of macronutrients and micronutrients. This nutrient deficiency can be caused by nutrient leaching due to displacement of nutrients on the exchange complex by soluble heavy metals (Derome & Lindroos, 1998), and also by soil erosion causing the loss of soil organic matter colloids and nutrients (Watson, et al., 2012). Liming adds Ca and Mg (if dolomite is used) to the soil system, with the other critical macronutrients (NPK) being added in commercial fertilizer blends to limed soils (Winterhalder, 1983; Derome, 2000).

Liming without the addition of N has been shown to stimulate N mineralization and nitrification in contaminated soils, most likely due to a stimulation of microbial activity caused by increase in pH and subsequent reduction in contaminant metal mobility (Derome & Saarsalmi, 1999; Tamm & Petersson, 1969; Fettell, et al., 2007). Liming acid soils can increase the availability of P (Derome & Saarsalmi, 1999), even when excess P has not been added (Kamprath, 2000; Holford, et al., 1994). There are two major mechanisms which increase P mobility in limed soils: (1) lime-induced decrease in P sorption onto the soil exchange complex which is caused by exchange sites becoming more negatively charged and desorbing P (Holford & Mattingly, 1976), and; (2) the hydrolysis of Fe and Al phosphates with increasing pH (Lindsay & Moreno, 1960; White, 2006). The second mechanism also increases the availability of P added to limed soils in NPK fertilizers.

Potassium is another important soil macronutrient required for plant growth (White, 2006), but little attention is currently given to exchangeable K in metal-contaminated soils which have been limed, perhaps because K is often added in fertilizer blends when liming occurs (Lautenbach, et al., 1995). When acid soils are limed, they have been found to retain more K (Thomas & Coleman, 1959), most likely due to the increase in CEC associated with liming (Magdoff & Bartlett, 1980). This mechanism is poorly understood since it has been shown that there is a decrease in selectivity for monovalent ions relative to divalent ions caused by CEC increase due to liming (Magdoff & Bartlett, 1980; Pratt, et al., 1962).

Sulphur is an important macronutrient, but is usually not lacking in acid-contaminated soils due to the large amounts of SO_2 emitted from smelting processes (Watson, et al., 2012). Sulphate concentrations in the soil solution can also be increased due to liming (Derome & Saarsalmi, 1999) as the increase in pH causes the exchange sites on the edges of clay minerals, organic matter, and Fe/Al oxides to become increasingly negatively charged inducing the desorption of sulphate (Chao, et al., 1962; Kamprath, 2000). This could lead to loss of sulfate from the soil due to leaching.

Some studies have shown that micronutrients (Mn and Zn) can become deficient in soils which have been limed, and must thus be added as amendments to fertilizers for optimum growth (Kukier & Chaney, 2000; Kowalenko & Ihnat, 2013). Manganese toxicity to plants is dependent not only on pH, but also on the availability of Ca^{2+} in the system. Adding large amounts of available Ca^{2+} ions can decrease Mn toxicity even if soil pH is not increased (Bekker, et al., 1994). There is a fine line for some micronutrients between toxicity and deficiency. Therefore the monitoring of soils and vegetation on limed site for signs of micronutrient deficiencies caused by liming is very important.

Liming as also been found to increase dissolved organic carbon (DOC) leaching (Andersson & Nilsson, 2001; Levonmaki & Hartikainen, 2007; Ahmad, et al., 2013). This increase in DOC with liming can be attributed to increased biological activity (Biasi, et al., 2008) and the formation of low molecular weight organic compounds which are prone to leaching (Andersson, et al., 1994).

1.3 Objectives of study

This study was undertaken to measure the interactions between added limestone and acid metal contaminated soil from the Sudbury region in both the soil solution and soil matrix. An un-eroded soil with a developed organic horizon was chosen for this study. The long term goal of this research is to determine the longevity of the limestone impact in the soil restoration program in Sudbury. Soil mesocosms were constructed to enable the control of as many environmental variables as possible and optimize the acquisition of relevant biogeochemical data in order to:

(1) investigate the dissolution of limestone in simulated rainwater;
(2) monitor the movement of limestone dissolution products through the soil, and;
(3) investigate the effects of liming and seeding on the movement of selected metal ions, nutrients, and non-metals through the soil column.

Although numerous studies have been performed on Sudbury soils, none have focused on soil solution chemistry, or on how the liming process changes the soil solution and soil matrix in a controlled laboratory experiment.

Chapter 2

2 Methodology

2.1 Overview

A soil mesocosm experiment was performed with packed soil columns to simulate the liming portion of the Sudbury re-greening program. Soil was collected from an unlimed site in the Sudbury region. The soil is acidic in nature and highly contaminated with a variety of anthropogenic metals. Columns were leached with simulated rainwater and the soil solution collected at various locations throughout the soil column. Soil solutions were analysed for a variety of parameters. After the completion of the column leaching experiment, the columns were taken apart and the soil material (pre and post leaching) was analysed for a variety of parameters.

2.2 Column construction and design

2.2.1 Column construction

Six columns each approximately 30.5cm long with a 20.3cm inside diameter were constructed from PVC pipe with a 2.5cm wall thickness. The columns were open at the top and closed at the bottom with a PVC cap that had a 2cm hole for drainage. Approximately 1L of plastic beads (3-4mm in diameter) and a layer of nylon mesh (0.5mm diameter holes) were installed at the bottom of each column to stop solid material from leaching through the column. During mesocosm construction, the soil was added one horizon at a time, starting with the bottom C horizon and moving up towards the LFH horizon. Air-dried soil was added in thin layers, while being moistened with a deionised water spay to allow for uniform leaching and avoid pockets of dry soil. The soil horizon thicknesses inside the column were similar to those of the pedon as sampled in the natural environment but with thinner Bf and BC mineral horizons due to mesocosm column length constraints. The weight of soil horizon material added to each column was recorded to ensure uniformity between columns, and used to estimate the bulk density of the sieved soil (Table 2).

2.2.2 Column design

The six columns were divided into two column types, three without (1-3) and three with (4-6) vegetation (Figure 2). Each column type had one control column, one calcite column and one dolomite column (Figure 2). Calcitic limestone (columns 2 and 5) and dolomitic limestone (columns 3 and 6) was spread on the top of the columns at a rate equivalent to 10 tonnes/ha (Figure 2). The application rate of 10 tonnes/ha was chosen because it is the same rate used for the re-greening program for the soils of the Sudbury region (Winterhalder, 1983; Lautenbach, et al., 1995). The vegetation columns were seeded with tickle grass (*Agrostis scabra*) six weeks after initial liming, again to mimic the Sudbury re-greening program time scale. Tickle grass is common on both acidic and neutral soils in the Sudbury region (Lautenbach, et al., 1995). Two small limestone columns, B-CAL and B-DOL (Figure 2) containing only limestone and leaching beads were also constructed to evaluate limestone dissolution rates and to assess the potential release of dissolved ions (metals and nutrients) onto the soil columns during each simulated rain event. A schematic column set up is shown in Figure 2.

Two types of lysimeters (gravitational lysimeters and tension lysimeters) were installed in each column to facilitate collection of soil solutions. The gravitational lysimeters were constructed with funnels packed with leaching beads attached to a PVC pipe which then exited the column below the lysimeter surface. These lysimeters, draining freely under gravity, provided free water samples over field capacity which flows through the soil macropores following precipitation events (Andreasson, et al., 2009). The tension lysimeters had porous Teflon cups attached to the end of a 10 cm capillary tube, being designed to allow the sampling of pore water, essentially mimicking the root hair (10 cm porous part, glass fiber wire; Rhizosphere research products) which draws plant-available water from smaller pores (meso- or micropores) (Andreasson, et al., 2009). For the remainder of the thesis, these sampling locations will be referred to as grav. (gravitational lysimeters) and ten. (tension lysimeters), followed by the sampling location letter (Figure 3). Each soil column was also monitored for moisture content and temperature using EC-TM sensors and EM-50 loggers (Decagon Devices) at two locations (Figure 3). The temperature and humidity in the laboratory were also continuously monitored during this experimental period using a household temperature and humidity monitor (Home Depot).

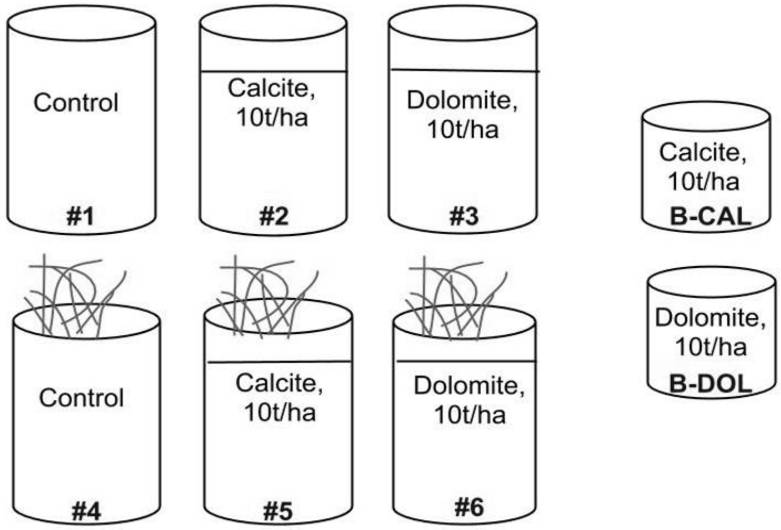

Figure 2: Soil mesocosm experimental design.

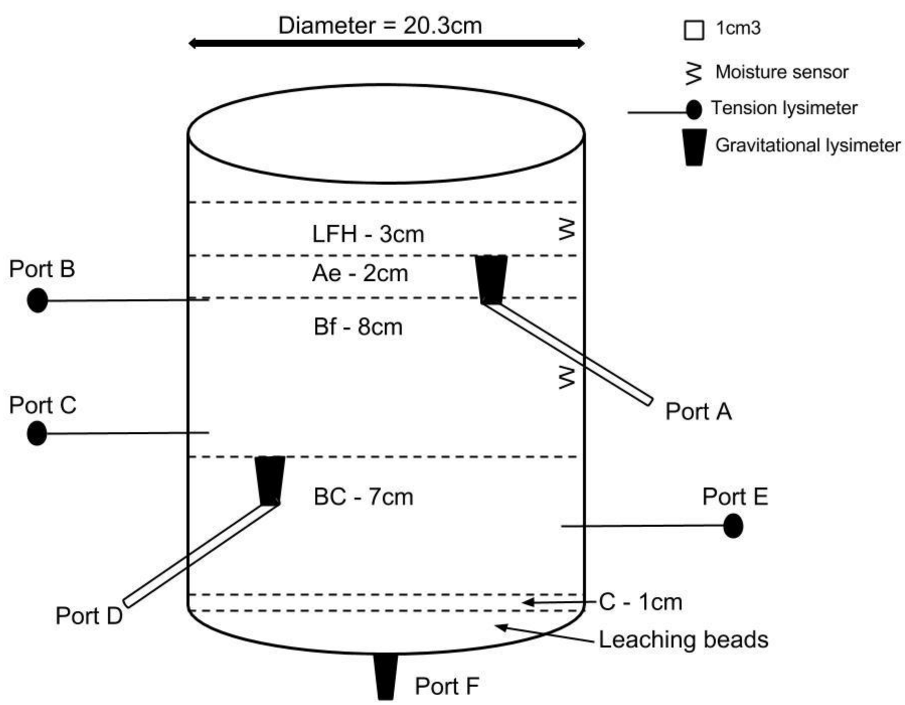

Figure 3: Soil mesocosm schematic depicting soil water sampling and moisture sensor locations within the simulated pedon.

2.3 Description of column material

2.3.1 Soil

2.3.1.1 Site description and soil collection

The soil used for the laboratory mesocosms was collected from inside the City of Greater Sudbury (Coordinates; N: 46°29'56.0", W: 80°58'20.2") (Figure 1). This location is approximately 11km south west of the Falconbridge smelter, 10km west of the Coniston smelter, and 9km north east of the Copper Cliff smelter, inside the semi-barren vegetation zone of Sudbury (Gunn, et al., 1995). This location was chosen because the area has never been impacted by the Sudbury re-greening processes such as liming as indicated by the low pH (3.7) of the organic horizon. Further, the surface horizons of the soils at this site are contaminated in the majority of the chemicals of concern outlined by the Sudbury Soil Study (Spiers, et al., 2012; Juckers, et al., 2013) (Table 3). The predominant vegetation at the site was an old growth oak stand with little undergrowth and few other tree species in the area. The surrounding forest contained coniferous species in more rocky areas. The soils on this site are an admixture of Orthic Dystric Brunisols in the poorly drained areas and Orthic Humo-Ferric Podzols in the better drained areas. The actual pedon sampled was the Podzolic soil with a well-developed Ae horizon and deeper mineral Bf horizons (Figure 4).

In the fall of 2011, a soil pit (approximately $1m^2$ and 70cm deep) was dug in the area described above. Fresh litter was removed before the soil pit was dug. Individual soil horizons were manually excavated with a stainless steel spade and separated into clean five gallon buckets. The spade was cleaned in between horizon samples to minimize contamination. The Podzolic soil profile has well developed LFH, Ae, Bf and BC horizons overlying the parent till which was deposited on bedrock (Figure 4).

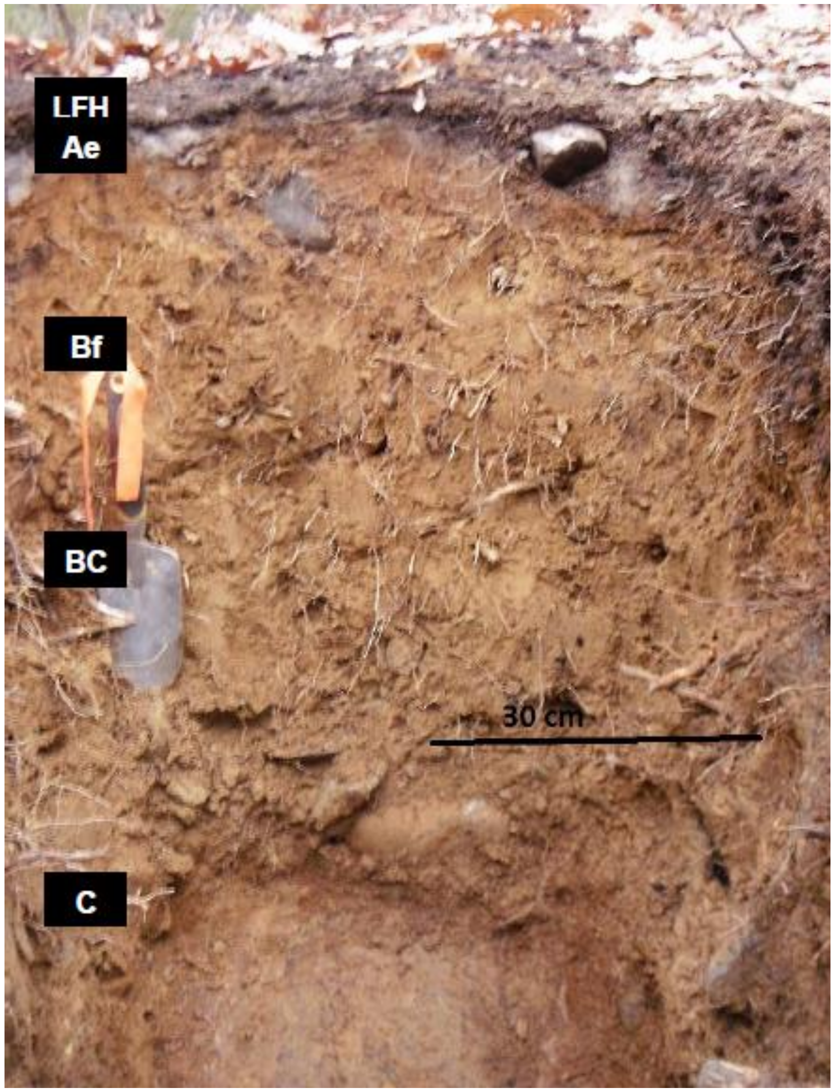

Figure 4: Soil profile showing one organic horizon (LFH) and four distinct mineral horizons (Ae, Bf, BC, and C).

2.3.1.2 Soil preparation

The soil was air dried at room temperature for two weeks before it was passed through a 2mm sieve using a Ro-Tap Shaker and homogenized. The organic horizon was sieved by hand to 6.25mm, with partially decomposed leaves and roots being lightly macerated to pass the sieve mesh. Rocks or large living roots were discarded. Approximately one kilogram of each horizon was removed for further analysis.

2.3.1.3 Soil classification methods

The pedon is classified in the Podzolic Order based on field physical characteristics (Soil Classification Working Group, 1998). However, in order to properly assign to the SubGroup, a series of chemical extractions and physical determinations (texture) were performed. The texture of each mineral soil horizon was determined using a hydrometer method described by Gee & Bauder (1986). The three chemical extractions required for Podzolic Order soil classification by the CSSC were performed; citrate-dithionite extractable iron, acid ammonium oxalate in darkness, and sodium pyrophosphate extractable iron (Loeppert & Inskeep, 1996). These extractions are used to estimate the chemical and mineral nature of: the total free iron, the poorly crystalline or active ion oxides, and the organically bound iron found in the soil horizons respectively (Loeppert & Inskeep, 1996). The procedure for each extraction was performed using the methods described by Loeppert & Inskeep (1996). The extractions were quantified for Fe and other associated metals by ICP-MS. As the content of organic carbon in the mineral horizons is also important for determining the SubGroup classification (Soil Classification Working Group, 1998), total carbon, nitrogen, and sulphur were quantified by high temperature combustion with thermal conductivity detection (Forest Resources and Soil Testing Laboratory, Thunder Bay ON.).

2.3.2 Limestone

Two types of limestone were used in this study, a calcitic limestone ($CaCO_3$) and a dolomitic limestone ($CaMg(CO_3)_2$). The amount of calcite, dolomite, and quartz in each sample was estimated by X-ray diffraction, with content of major elements being quantified by X-ray fluorescence. To determine the particle distribution of the limestone samples, samples were hand-sieved to produce a series of fractions between >2 mm to <0.045 mm. Each size fraction was ground by mortar and pestle and digested using the three acid digest (2.4.4.2) to quantify their metals and metalloid contents. Limestone samples, along with a sample of the Bf and C mineral soil horizons, were also analyzed for their strontium isotopic ratios ($^{87}Sr/^{86}Sr$) to evaluate the potential to use strontium isotopes as a tracer for the movement of limestone dissolution products through soil. The strontium isotopic analyses were carried out by Thermal Ionization Mass Spectroscopy (TIMS) at The Pacific Centre for Isotopic and Geochemical Research. The results of this initial study are not included in this thesis but can be found in Appendix C.

2.3.3 Simulated rainwater

Each column was leached with simulated rainwater for the duration of the soil mesocosm experiment. During three storm events in May and June 2012, rain water from the Sudbury area was collected for chemical analysis. The samples of rain water had a arithmetic mean (hereafter referred to as mean) pH of 4.9 and an electrical conductivity of 13 µS/cm. Simulated rainwater was then prepared by adding sulphuric acid (4.02 mg/L) and ammonium chloride (19.5 mg/L) to deionised water to achieve the appropriate pH (4.9 ± 0.5) and conductivity (13 ± 3 µS/cm) respectively. Sulphuric acid was used to alter the pH because it is present in acid rain. Ammonium chloride was used to alter the electrical conductivity because NH_4^+ was not analysed.

2.4 Collection and analysis of product

2.4.1 Leachate sample collection

Simulated rainfall was produced over the mesocosms with custom designed “rainulators” (rain simulators) constructed by attaching a micro sprinkler to the bottom of a one liter holding vessel (Figure 5). During a rainfall event, the holding vessel containing the simulated rain was pressurized with Ar gas (approximately 2 psi) until a fine mist of rain was observed exiting the micro sprinkler. This technique produced a uniform spay on the surface of each column, allowing for precise control of both volume and rain time. The soil mesocosms were leached twice a week for 23 weeks (46 rain events) with a total of 497 mm of simulated rain during the experiment, an amount reflecting the mean precipitation received in the City of Greater Sudbury for the months of May to October, inclusive (Environment Canada, 2013).

Leachate samples were collected from both gravitational lysimeters and tension lysimeters after each rainfall event. Gravitational lysimeter samples were allowed to drain freely for 24 hours into partially sealed sample collection bottles. The bottles, located on the bench top below the soil mesocosms, were vented to allow gravitational flow to proceed. After collection, the samples were filtered through a 0.45 µm syringe filter.

Figure 5: Rainulator positioned on top of column.

The tension lysimeters were sampled 24 hours after each rain event by attaching a 10 mL syringe to the tension lysimeters and removing the pore water sample under light tension. The tension lysimeters are therefore sampling water which is below field capacity and held in the micropore space of the soil. As the porous Teflon cup of the tension lysimeters has pores with a mean diameter of 0.2 μm, filtration after collection was not necessary. All lysimeter collection volumes were recorded to enable accurate water balance calculations. The small limestone column (B-CAL and B-DOL) gravitational leachates were also sampled for analysis. A simulated rain sample was also collected from one rainulator (conducted on a rotational basis) during each rainfall event to enable monitoring of possible contamination, as well as changes in pH and conductivity of the stored simulated rainwater over time. Each rain event produced a total of 39 samples (18 gravitational lysimeter, 18 tension lysimeter, two small limestone column, and one rainulator sample). All samples were analyzed for pH and conductivity immediately after collection and then refrigerated for further analysis.

2.4.2 Leachate analysis

2.4.2.1 pH, conductivity, and oxidation/reduction potential

The pH and electrical conductivity (EC) of all leachate and rainulator samples were analyzed within 24 hours of collection, with measurements performed with a pH combination electrode (Accumet) and a conductivity probe (Accumet) attached to Accumet (AB15) meter and Accumet (AB30) meter, respectively. The oxidation/reduction potential (E_H) of the solution samples were measured using a platinum electrode with a calomel reference (Accumet) attached to a ThermoOrion (Model 370) meter. All pH, EC, and E_H samples were analysed with the probes and meters described above. All leachate and rainulator samples were analysed for E_H for the first 13 rain events, and then every second event thereafter to provide measurements for 30 of the total of 46 rain events (1170 total samples). Quality control analysis included a duplicate analysis every 13 samples and the recalibration of pH, EC, and E_H instruments every 39 samples.

2.4.2.2 Cations

Dissolved ions (Al, As, B, Ba, Ca, Cd, Co, Cr, Cu, Fe, Ga, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Rb, Sb, Sc, Se, Si, Sn, Sr, Ti, V, Zn, Zr) were quantified by quadrupole ICP-MS (Varian 810) using normal sensitivity mode optimized to maximize the signal-to-noise ratio (Table 1). To correct for mass bias and calibration drift, an internal standard solution containing 10 μg/L of Be, Re, Ru, was bled into the sample uptake line using a glass T-shaped mixing chamber (Glass Expansion ™). Samples were diluted by a factor of two with deionised water before analysis. Quality control samples consisted of a blank, duplicate, two spiked samples, certified reference water solution (TMDA 51.3) and internal reference solution with every batch of 30 samples. The internal reference solution was made from a bulk Living With Lakes (Laurentian University, Sudbury, Ontario) roof runoff sample which contained all elements of interest (natural or spiked). All leachate samples (including lysimeter, small limestone columns, and rainulator samples) from each rain event were quantified in this manner.

Table 1: Instrumentation parameters for Varian (810) ICP-MS in normal sensitivity mode.

		Leachate Samples	Soil Samples
	Parameters	**Settings**	**Settings**
Gas Flow (L/min)	Plasma Flow	16.5	16.5
	Auxiliary Flow	1.65	1.65
	Nebulizer Flow	0.23	0.23
	Sheath Flow	1	1
RF	RF Power (kW)	1.35	1.35
Sample Introduction	Sampling Depth (mm)	6	6
	Pump Rate (rpm)	4	4
	Stabilization Time (s)	60	60
	Spray Chamber (˚C)	3	3
Ion Optics (V)	1st Extraction Lens	-1	-1
	2nd Extraction Lens	-374	-265
	3rd Extraction Lens	-242	-218
	Corner Lens	-377	-291
	Mirror Lens Left	26	16
	Mirror Lens Right	22	26
	Mirror Lens Bottom	26	32
	Entrance Lens	0	0
	Entrance Plate	-31	-31
	Fringe Bias	-2.5	-2.6
	Pole Bias	0	0
Quadrupole Scan	Scan Mode	Peak Hopping	Peak Hopping
	Dwell Time (ms)		
	Points per Peak	1	1
	Scans/Replicate	25	25
	Replicates per Sample	4	4

2.4.2.3 Anions

Anions (F^-, Cl^-, NO_2^-, Br^-, NO_3^-, PO_4^{3-}, SO_4^{2-}) in the lysimeter solutions were quantified by ion chromatography (DX-120, 0.5M/0.5M Na_2CO_3/$NaHCO_3$ eluent). Samples were diluted by a factor of 3.86 with deionised water before analysis. Quality control samples consisted of a blank, duplicate, spike, certified reference solution (QCSPEX-AI, Fisher Scientific) and the internal reference solution sample every 18 real samples. Leachate samples (lysimeter and rainulator samples) from the first 20 rain events were analyzed, with samples from every second rain event being analyzed thereafter for a total of 34 of the 46 rain events. Small limestone column samples were not analyzed by ion chromatography due to their high carbonate ion content.

2.4.2.4 Dissolved organic matter

Dissolved organic matter was quantified using a UV-Vis spectrometer method at 254nm (Ultrospec 3000, Pharmacia Biotech) (Amrhein, et al., 1992; Chen, et al., 1977; Traina, et al., 1990). A randomly selected subset of samples was quantified for dissolved organic matter by the non purgeable organic carbon (NPOC) method on a Shimadzu 5000 TOC-analyser, with the results being used to establish a calibration curve for estimation by absorbance at 254nm. A technical note describing the method development can be found in Appendix B.

2.4.3 Spring flush simulation and column dismantling

The soil mesocosms were leached for 23 weeks, placed in a freezer at -17°C for one week, removed and allowed to thaw with frozen, crushed simulated rainwater on the soil surface. This simulated a spring flush event similar to what occurs after the soils have been frozen for the winter months with minimal vertical water movement occurring. The small limestone columns (B-CAL and B-DOL) were treated in the same manner.

At the end of the experiment, the soil mesocosms were frozen to enable dismantling and subsequent analysis of the soil matrix material. The frozen soil mesocosms were removed from the PVC pipe and separated by cutting the frozen soil column into eight sections using a chisel and hammer. The soil samples were then separated at soil horizon boundaries and by additional depth increments where applicable (Figure 6). Each of the soil mesocosms was dismantled in the same manner, with the exception of Column 6, which was accidentally destroyed during the first freeze thaw cycle. The moisture content of each sample was estimated by measurement of loss on air drying to constant weight, a two week process at room temperature with daily stirring of the each sample. Once dry, samples were stored in plastic bags until further analysis.

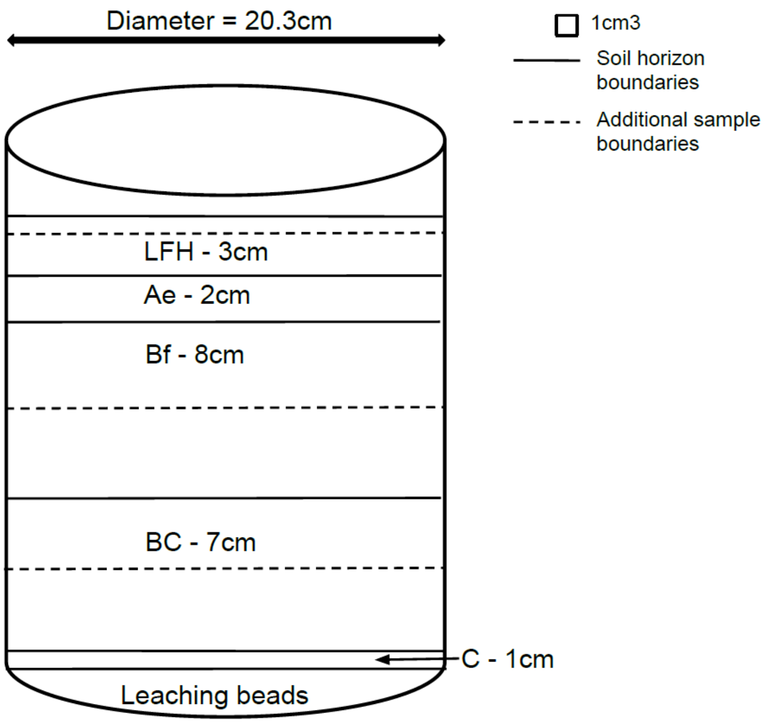

Figure 6: Soil mesocosm schematic depicting horizon depth and soil matrix sample location boundaries.

2.4.4 Soil analysis, before and after leaching

2.4.4.1 pH, conductivity, and oxidation/reduction potential

The pH of the soil samples was measured using a 1:2 soil to solution ratio (1:4 for organic LFH soils) in both deionised water and 0.01 M $CaCl_2$ (Thomas, 1996). The electrical conductivity was measured using 1:2 soil to deionised water ratio (1:4 for organic LFH soils). For both pH and electrical conductivity measurements, the samples were mixed with the solution and allowed to reach a steady state condition for 1 hour prior to insertion of the probe into the supernatant solution (Thomas, 1996). The E_H was determined using a saturated paste method with deionised water, following covered equilibration for 1 hour to minimize interaction with the atmosphere. Quality control analysis included a duplicate analysis every 10 samples and recalibration of pH, EC, and E_H probes every 30 samples.

2.4.4.2 *Total elemental analysis*

A wide suite of metals and metalloids was quantified for each soil sample (original soil mesocosm material and soil material following completion of the mesocosm experiment). The soil samples were oven dried for 24 hours at 105°C and lightly crushed by mortar and pestle to pass a 75 μm sieve. 0.2 g of soil was weighed into a 50 mL flat bottom tube (polypropylene), then 10 mL of 10:1 HF and HCl was added, and the mixture heated to 110°C for 210 minutes (or to dryness). This step was then repeated, after which 7.5 mL of HCl and 7.5 mL of HNO_3 were added to each tube and the mixtures heated to 110°C for 240 minutes until the samples were dry. In the final step, 0.5 mL of HF, 2 mL of HCl, and 10 mL of HNO_3 were added to the tubes, with heating to 110°C for 60 minutes to allow sample to dissolve and remain in solution. The resultant solutions were then diluted to 50 mL with deionised water, with a further factor of 10 dilution of a subsample before analysis by ICP-MS (Varian 810) (Table 1). The digestion was performed on a programmable digestion block (Questron Technologies Corp) and all acids were concentrated, trace metal grade (Fisher Scientific). Quality control analyses included a method blank, a duplicate sample, two spiked samples, and three certified reference materials (SU-1B, RTS-3a, and LKSD-1) every 15 real samples. An internal standard solution of Re and Ru (10 μg/L) was used to correct for mass bias and calibration drift.

Organic carbon, nitrogen, and sulphur were quantified by high temperature combustion with thermal conductivity detection (Forest Resources and Soil Testing Laboratory, Thunder Bay ON.).

The amount of inorganic carbon in the soil samples was quantified using the method outlined by Bundy & Bremner (1972). Approximately seven grams was used for mineral soil samples and two to four grams for LFH samples, depending on the estimated carbonate content. The method required that only up to 30 mg of inorganic carbon be present in each sample for reliable analysis, therefore samples containing more than this amount were reduced in size and reanalysed to ensure accuracy. The soil was weighed into a flat bottom flask. The flask was sealed with a rubber stopper. A glass tube with a needle-puncture stopper was inserted into the flask via a hole in the rubber stopper. A small beaker containing 5 ml of 2 M KOH was attached to a glass tube. 50ml of air was removed once the flask was assembeled with the soil and the small beaker containing KOH. 20 mL of 2 M HCL was injected into the flask via the needle-puncture stopper with a hypodermic syringe. The flask was then gently swirled and allowed to stand at room temperature for 24 hours. After this time the contents of the small beaker containing 2 M KOH was transfered to a flask, diluted to 50 mL with deionised water, and titrated with 1 M and 0.1 M HCl. The experimental set up and titrating procedure can be found in Bundy & Bremner (1972). Quality control samples included a blank, a pure carbonate ($CaCO_3$) (Fisher Scientific), and a duplicate every 8 samples. The inorganic carbon results for pure calcium carbonate were within ±9 wt% of actual value.

2.4.4.3 Metal and metalloid extractions

In order to determine the how metals and nutrients found in the soil react with the exchange complex, before and after the experimental period, a series of extractions was performed on the soil materials used for the mesocosms. Water soluble metals and metalloids were determined with a simple water extraction, with 5 g of mineral soil or 2 g of organic soil being weighed into 50mL centrifuge tubes into which 20 mL of deionised water was added and the samples being placed on a reciprocal shaker for 24 hours. Samples were then centrifuged and the supernatant filtered though a 0.45µm cellulose filter and diluted for analysis by ICP-MS. The bioavailable metal and metalloid content was determined by a $LiNO_3$ extraction developed by Abedin, et al., (2012). The method follows the same procedure as outlined above for water extraction except 0.01 M $LiNO_3$ is used as the solution phase instead of deionised water.

The cation exchange capacity of the soil samples was estimated using a one step $BaCl_2$ extraction (Hendershot & Duquette, 1986). 3 g of mineral soil (0.5 g organic soil) was weighed into 50 mL centrifuge tubes, 30 mL of 0.1 M $BaCl_2$ added to each sample, and the mixture shaken at 175 rpm for 12 hours on a New Brunswick Scientific C10 platform shaker. Samples were then centrifuged, filtered through a 0.45 µm filter and analyzed for exchangeable cations by ICP-MS. To determine the effective cation exchange capacity (ECEC), the major cations (Na, K, Mg, Ca, Al, Fe and Mn) are summed (Hendershot, Lalande, & Duquette, 2006). The true cation exchange capacity (CEC) requires estimation of the amount of exchangeable H^+ for soils with a pH<6.0 (Schwertfeger & Hendershot, 2008). The exchangeable H^+ was determined by shaking the remaining solid sample with 30 mL of deionised water for 12 hours to remove residual $BaCl_2$, centrifuging the mixture (discarding the supernatant), adding 30 mL of NH_4Cl, shaking again for 12 hours, centrifuging at 3000 g for 5 minutes (Mistral 2000), and filtering the resultant supernatant through 0.45 µm cellulose filter paper prior to analysis of the released barium by ICP-MS. The theory behind this method is that the barium, which has exchanged with cations previously on the exchange complex, including H^+, will then be released from exchange sites by the addition of NH_4Cl. The exchangeable H^+ can be calculated by the difference between the ECEC and the CEC determined by barium quantification. For each extraction (water, bioavailable, and extractable metals), a method blank sample, a duplicate sample, and two spiked samples were analyzed every 15 samples.

Chapter 3

3 Results and discussion

3.1 Soil used for mesocosm experiment

3.1.1 Soil classification

The pedon used for the mesocosm experiment was collected from an unlimed site in the Sudbury area (full description in section 2.3.1.1). The soil is classified as an Orthic Humo-Ferric Podzol, with a horizon sequence of LFH, Ae, Bf, BC, and C, namely one organic layer and four mineral horizons (Soil Classification Working Group, 1998). The LFH horizon is an organic horizon developed from the accumulation of plant organic material, which consists of three sub-horizons; the L horizon which is fresh litter and least decomposed material, the F (fermentation) horizon which contains partially decomposed organic matter in which it is difficult to distinguish any original structures due to the stage of decomposition, and the H horizon which consists of well-decomposed organic material, the degree of humification a result of micro-organisms aiding in decomposition (Soil Classification Working Group, 1998). The LFH horizon is highly organic (37.1% carbon) and has a high solution electrical conductivity and a high cation exchange capacity (CEC) (Table 2). The Ae mineral horizon is white (10YR mm/mm) in colour, a product of the eluviation of clay, soluble iron and aluminum oxyhydroxides, and organic matter from this horizon (Figure 4). The Bf horizon is over 30 cm thick and enriched in both amorphous iron and aluminum oxyhydroxides and colloidal humic substances. The Bf horizon classification was applied to this soil horizon because it contains between 0.5-5 % organic matter, over 0.4 % pyrophosphate extractable Fe and Al, and has a sandy texture (Table 2) (Soil Classification Working Group, 1998). The BC horizon is classified as such because it contains much less pyrophosphate extractable iron and aluminum, and also less organic matter than the Bf horizon (Table 2) (Soil Classification Working Group, 1998). The C horizon is the parent material which is (compared to the other mineral soil horizons) relatively unaffected by pedogenic processes (Soil Classification Working Group, 1998). The full soil profile is fairly shallow, with a total depth to bedrock of approximately 70cm, typical for a podzolic soil in this region.

3.1.2 Appropriateness of collected material

As the objective of this study was to investigate the movement of limestone dissolution products through acidic metal-contaminated soil, it was important to establish that the soil collected is in fact acidic in nature and contaminated with metals.

3.1.2.1 Acidity

The pH of the soil is very low, especially in the top LFH organic horizon (Table 2), indicating an absence of carbonate material from either the parental material or the re-greening efforts in Sudbury.

Table 2: Physical and chemical properties of the organic and mineral soil horizons collected for the mesocosm experiment.

Parameter	Horizon				
	LFH	Ae	Bf	BC	C
pH	3.72	4.26	4.75	4.76	4.56
EC (µS/cm)	86.4	25.2	15.7	15.2	11.3
E_H (mV)	528	546	517	523	529
C (%)	37.1	1.4	1.4	0.9	0.5
N (%)	1.7	0.1	0.11	0.07	0.03
S (%)	0.18	0.01	0.03	0.02	0.01
CEC (cmol/kg)	247	30.7	12.9	10.1	12.2
%Sand	*n.d.*	80.4	77.5	77.2	29.4
%Silt	*n.d.*	11.1	20.1	17.7	65.4
%Clay	*n.d.*	8.5	2.5	5.0	5.1
Bulk Density* (g/cm^3)	0.272	0.887	0.837	0.955	1.35

*Bulk Density of sieved and homogenised soil used for column construction
n.d. not determined

3.1.2.2 Total metal content

The LFH horizon is highly contaminated in As, Co, Cu, Ni, Pb, and Se compared to Ontario Ministry of the Environment guidelines for soils with a pH of less than 5.0 (Table 3) (MOE (Ontario Ministry of the Environment), 1997). Arsenic, Co, Cu, Ni, Pb, and Se are all considered chemicals of concern (COC) for Sudbury soils because of their high concentration in the upper soil region (relative to the MOE guidelines), indicative of aerial deposition related to long term smelter emissions (Wren, et al., 2012). The total concentrations of all COC's decrease from the upper layers of the soil profile down to the parent material (horizon C) such that the concentrations of all COC are above the MOE Table F guidelines in the upper soil horizon, but well below the guideline limits for all lower soil horizons. The concentrations of all metals are above the MOE Table F guidelines in the upper soil horizon with the exception of Zn (Table 3). Other detrital metals such as Al, Fe, Mn, V, as well as plant nutrients stay fairly constant throughout the soil profile (Table 3).

Table 3: Total metals concentrations in soil collected for mesocosm experiment.

Element	Horizon					Table F
	LFH	Ae	Bf	BC	C	
Al (%)	6.33	6.56	7.12	7.65	9.04	*NC*
As	90.9	9.85	3.03	3.14	4.31	17
B	16.1	15.5	13.2	20.3	20.5	*NC*
Ba	304	422	371	408	389	*NC*
Ca (%)	1.09	1.01	1.13	1.17	1.21	*NC*
Cd	2.91	0.347	0.498	0.475	0.467	1
Co	124	2.39	10.1	11	22	21
Cr	67.8	23.6	56.1	66.9	81.9	71
Cu	1140	83.6	42.2	31.9	88.6	85
Fe (%)	5.88	0.7	2.02	2.37	3.57	*NC*
K (%)	1.05	1.7	1.62	1.87	1.6	*NC*
Mg (%)	0.859	0.365	0.823	0.941	1.14	*NC*
Mn	227	150	220	272	375	*NC*
Na (%)	1.48	2.41	2.53	2.71	2.25	*NC*
Ni	2870	28.1	42.7	42.5	68.4	45
P	423	83.4	233	251	554	*NC*
Pb	152	14.7	11.4	13.1	12.4	120
Se	8.73	1.43	1.13	0.994	1.42	1.9
Sr	194	204	206	212	206	*NC*
Ti (%)	0.218	0.244	0.274	0.309	0.385	*NC*
V	48.3	28.5	55.3	67.6	85.1	91
Zn	108	14.9	38.3	39.6	55.1	160

NC no criterion
All values are in µg/g, dry weight, unless otherwise noted
Table F criterion applies to soil with pH<5.0 (MOE, 1997)

3.1.2.3 Bioavailable metal content

The bioavailable concentration of metals and nutrients were also quantified; the concentration of bioavailable metals is small compared to the total metal concentration (Table 4, Table 5). This confirms the observations in other recent assessments of contaminated Sudbury soil (Abedin et al, 2008; Nkongolo, et al., 2013). However, although the ratio of bioavailable metal to total metal concentration may be low, the elements Al, Cu, Fe, and Ni all have high bioavailable concentrations which can potentially be available for plant uptake (Table 4) (Nkongolo, et al., 2013). Given the high levels of COC's , coupled with the high $Al_{(total)}$ content, and the low pH, the soil collected is appropriate for this study.

Table 4: Bioavailable concentration of metals and nutrients of soil collected for mesocosm experiment.

Element	Horizon				
	LFH	Ae	Bf	BC	C
Al	76.8	12.9	9.28	8.28	7.94
As	1.7	0.06	0.017	0.006	0.009
B	0.232	0.001	<0.001	<0.001	0.076
Ba	2.45	0.622	3.42	3.24	2.52
Ca	163	17.1	8.29	8.22	13.6
Cd	0.166	0.017	0.024	0.009	0.009
Co	0.982	0.222	0.201	0.18	0.424
Cr	0.26	0.034	0.023	0.013	0.001
Cu	37.3	7.13	0.323	0.143	0.145
Fe	155	16.8	10.8	4.76	4.05
K	0.276	0.012	0.009	0.006	0.011
Mg	64	6.37	3.4	2.75	8.35
Mn	20	8.97	1.67	1.69	6.35
Na	19.2	4.61	5.16	4.67	7.83
Ni	28.8	3.6	1.84	0.833	1.12
P	22.5	0.842	<0.001	<0.001	0.643
Pb	0.788	0.016	0.001	0.002	0.002
Se	0.482	0.023	<0.001	<0.001	<0.001
Sr	1.2	0.146	0.102	0.107	0.151
Ti	0.971	0.627	0.05	0.076	0.041
V	0.193	0.0237	<0.001	<0.001	<0.001
Zn	4.87	2.64	1.46	0.681	0.397

All values are in µg/g, dry weight, unless otherwise noted

Table 5: Calculated ratio of bioavailable to total element concentration for soil horizons used in mesocosm study.

Element	Horizon				
	LFH	Ae	Bf	BC	C
Al	0.121	0.02	0.013	0.0108	0.009
As	1.87	0.608	0.551	0.197	0.204
B	1.44	0.0639	*n.d.*	*n.d.*	0.371
Ba	0.806	0.147	0.922	0.794	0.648
Ca	1.5	0.169	0.073	0.070	0.112
Cd	5.7	4.84	4.8	1.96	1.9
Co	0.792	9.29	1.99	1.64	1.93
Cr	0.383	0.143	0.041	0.02	0.002
Cu	3.27	8.53	0.765	0.448	0.164
Fe	0.264	0.24	0.0535	0.0201	0.0113
K	0.003	<0.001	<0.001	<0.001	<0.001
Mg	0.745	0.175	0.041	0.029	0.073
Mn	8.81	5.98	0.759	0.621	1.69
Na	0.13	0.019	0.020	0.017	0.035
Ni	1	12.8	4.31	1.96	1.64
P	5.32	1.01	*n.d.*	*n.d.*	0.116
Pb	0.518	0.106	0.0113	0.0125	0.013
Se	5.52	1.61	*n.d.*	*n.d.*	*n.d.*
Sr	0.619	0.072	0.05	0.0505	0.073
Ti	0.044	0.026	0.002	0.002	0.001
V	0.4	0.083	*n.d.*	*n.d.*	*n.d.*
Zn	4.51	17.7	3.81	1.72	0.721

All values in % bioavailable concentration compared to total concentration.
n.d. not determined

3.2 Dissolution of limestone

The processes and kinetics of the dissolution of limestone are important factors for understanding the release and movement of limestone dissolution products through soil profiles. This section describes the physical and chemical properties of both the calcitic and dolomitic limestone used for this study. The limestone dissolution experiment described here was performed on limestone samples without any soil, using simulated rainwater with a low pH (4.9) and a low electrical conductivity (13 µS/cm) under atmospheric conditions in a laboratory setting. The results of the small limestone columns which were leached during the soil mesocosm experiment are also described and discussed in this section.

3.2.1 Results

Two distinct agricultural grade limestone products obtained from two different quarries in Ontario, Canada were used for this research initiative, a calcitic limestone and a dolomitic limestone. The calcitic limestone contains very little dolomite and some quartz, the dolomitic limestone contains a higher amount of dolomite, some calcite and also some quartz. The amount of Ca, Mg, and other metals in each limestone particle size fraction was quantified (Appendix Table 11). The calcitic material contains 10 % more calcium than the dolomitic material, with the latter containing almost 14 % more magnesium. The calcitic product contains only 0.6 % magnesium (Table 8). Both agricultural products contain approximately 0.25 % Fe, with the calcitic material containing almost five times as much Al (0.275 % compared to 0.056 %) (Table 6). The calcitic limestone also contains much higher concentrations of Ba, Co, Cu, K, Na, P, Rb, Sn, and Ti compared to the dolomitic material (Table 6). The dolomitic limestone, on the other hand, contains much higher concentrations of As, Cd, Mn, Pb, and Zn, with the concentration of Pb and Zn being above the MOE Table F guideline for soils (Table 6, Table 3) (MOE, 1997). The calcitic and dolomitic material both had a similar particle size distribution pattern, especially in the fine (<0.45-0.075 mm) and coarse (2-4 mm) fractions (Figure 7).

Table 6: Concentration of metals and nutrients in limestone samples used for mesocosm experiment.

Element	Limestone	
	Calcitic	Dolomitic
Ca (%)	34.8	24.3
Mg (%)	0.577	14.3
Al	2749	563
As	1.03	2.11
B	17.2	22.2
Ba	34.2	13.0
Cd	<0.05	1.76
Co	2.52	0.642
Cr	3.98	3.20
Cu	29.3	10.1
Fe	2502	2576
K	1706	263
Mn	113	399
Na	365	<1
Ni	20.6	4.66
P	86.4	22.6
Pb	18.1	217
Rb	6.13	0.607
Se	<0.6	<0.6
Sn	96.8	10.7
Sr	171	194
Ti	96.4	39.6
V	6.73	3.5
Zn	19.1	1105

All values are in µg/g, dry weight, unless otherwise noted

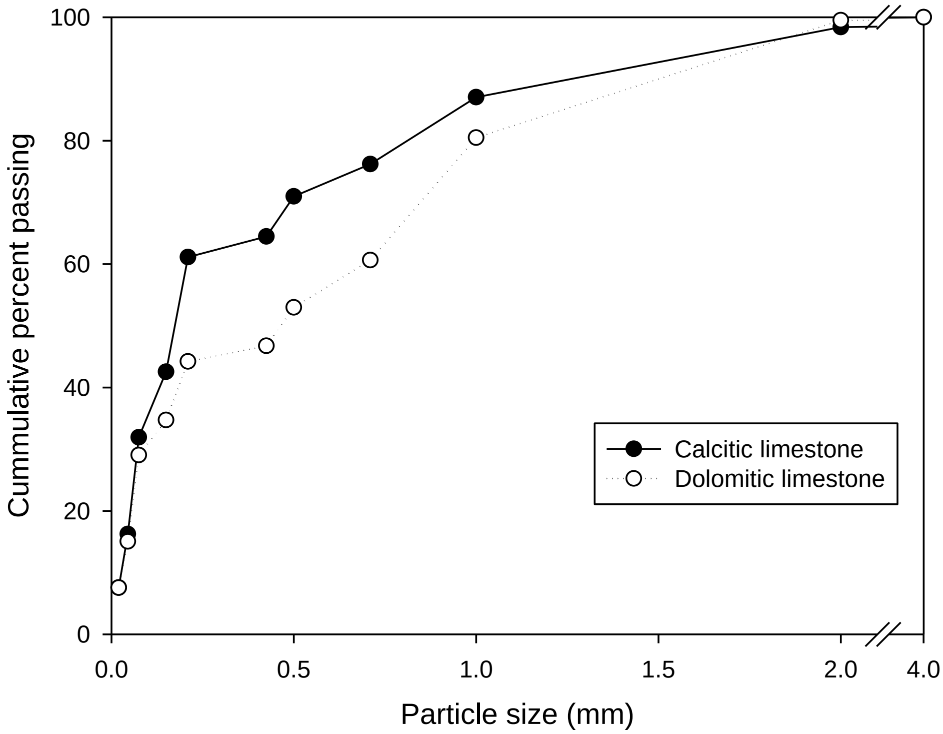

Figure 7: Size distribution curve for calcitic and dolomitic limestone samples.

The chemical analysis of the leachate samples collected from the small limestone columns enabled the evaluation of the quantity of the individual limestone dissolved during each rain event. The summation of the total amount of Ca and Mg in the leachate samples over the duration of the experiment enabled estimation of the cumulative total amount of Ca and Mg released in each rain event (Figure 8). A least squares linear regression analysis of the data demonstrates the high R^2 values between rainfall and the amount of Ca and Mg in solution (Table 7). The dissolution rate at the beginning of the experiment (first 55mm of rain) was greater than for the remainder of the experiment, with the latter period being fairly constant (Figure 8). This linear regression analysis, along with the total amount of Ca and Mg present in the original limestone used for the small limestone columns, enabled the estimation of the amount of rainfall required for the complete dissolution of Ca and Mg from the limestone samples (Table 8). The estimation of time for the dissolution of calcite and dolomite is based on 657mm of rainfall, the mean for one year in the City of Greater Sudbury (Table 8) (Environment Canada, 2013). Based on this dissolution model, the dolomitic material will take approximately twice as long to dissolve as the calcitic limestone (Table 8).

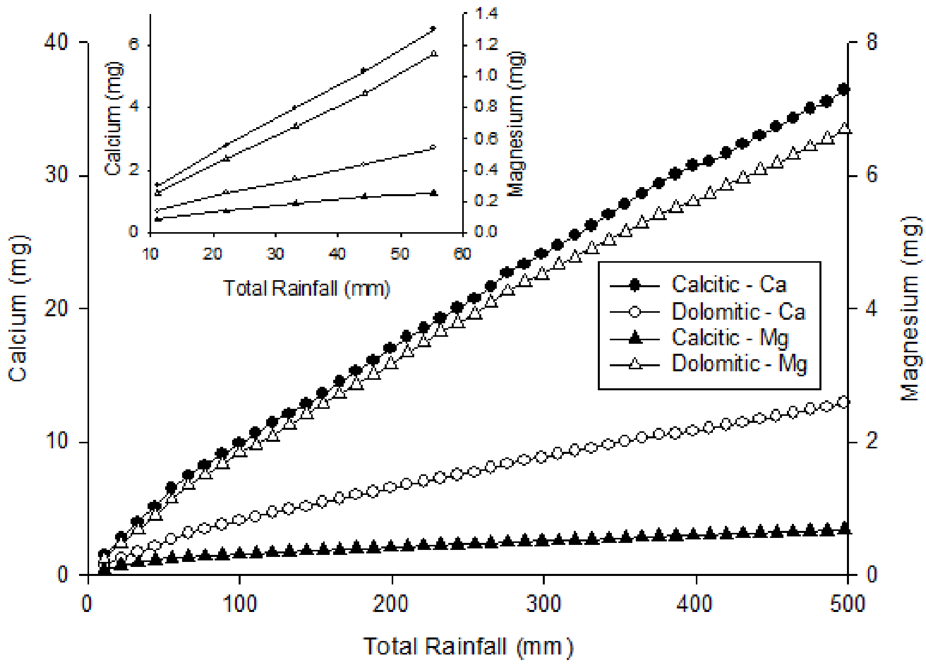

Figure 8: Cumulative amount of calcium and magnesium in limestone samples released during each rain event: total rainfall of 497mm (11mm each rain event). The data for the first 5 rain events shown in inserted graph.

Table 7: Regression coefficients (R^2) between cumulative Ca and Mg dissolution and rainfall.

	Element	
Limestone	Ca	Mg
Calcitic	0.996	0.968
Dolomitic	0.991	0.994

The pH of the limestone leachate solutions is illustrated in Figure 9. As the pH of the applied synthetic rainwater is 4.9, the dissolution of calcitic limestone and dolomitic limestone both increase the pH of the leachate solutions by 1-3 pH units, with a larger increase in pH at the beginning of the experiment and a slow decrease throughout the experiment (Figure 9). The pH data are variable, with large spikes being noted. However, the data for the pH of the dolomitic and calcitic limestone weathering solutions show the same patterns over time (Figure 9).

Table 8: Estimated total rainfall required to dissolve limestone and release calcium and magnesium into solution.

Limestone (element)	Total rainfall required to dissolve (L)	Years until dissolved*
Calcitic (Ca)	26	39
Calcitic (Mg)	28	42
Dolomitic (Ca)	53	80
Dolomitic (Mg)	57	86

*Based on 657mm of annual precipitation

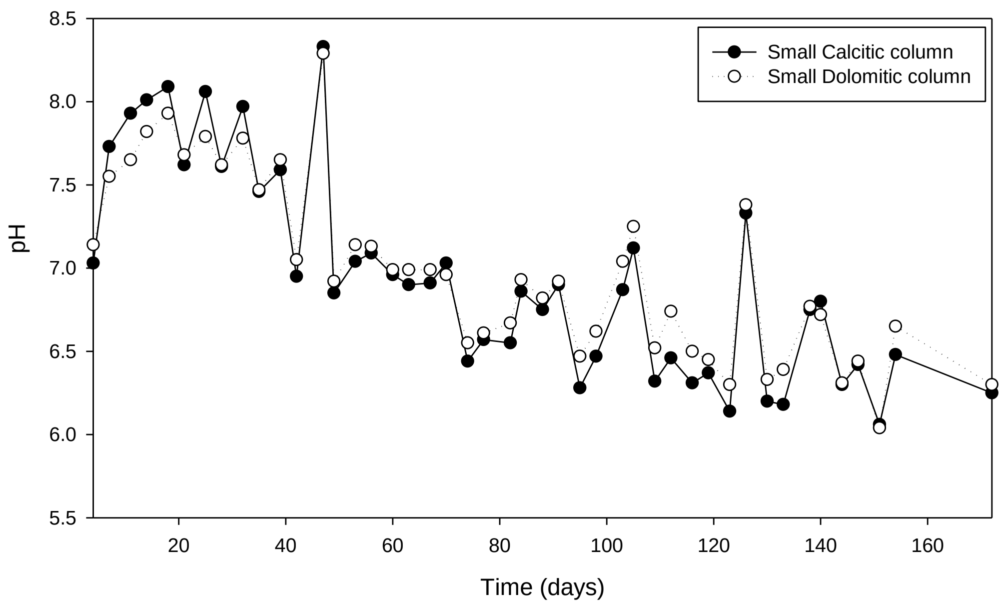

Figure 9: pH of small limestone column samples during the limestone dissolution experiment.

The dissolution of limestone releases not only Ca and Mg into solution, but can also release the other elements present in the limestone-hosted minerals. The addition of these elements may be useful to allow monitoring of the movement of contaminant ions through the soil profile. The data in Table 9 document the mean and ranges for the limestone leachate samples from the dissolution experiment, with many elements displaying large ranges in concentration. For example, Cr has a mean value of only 0.907 µg/L but a maximum value of 22.4 µg/L for the release from the calcitic limestone material (Table 9). Trends for some elements in the leachate solutions do not mimic the concentrations in the original limestone material. For example, the total Zn concentration is much higher in the dolomitic material; however, the dissolution of calcitic limestone with the artificial rainwater released more Zn when compared to the dolomitic limestone. (Table 6, Table 9).

Table 9: Concentration of elements in leachates from small limestone columns (mean and ranges).

Element	Limestone	
	Calcite	**Dolomite**
Ca (mg/L)	13.8 (5.48-25.6)	4.91 (1.66-11.8)
Mg (mg/L)	0.259 (0.105-1.42)	2.54 (1.53-4.39)
Al	20.1 (<0.6-80.1)	4.38 (<0.6-30.1)
As	<1	<1
B	0.987 (<1-4.84)	0.949 (<1-3.99)
Ba	3.08 (1.62-4.48)	16.7 (3.5-39.3)
Cd	<0.8	<0.8
Co	<0.6	<0.6
Cr	0.907 (<0.5-22.4)	0.827 (<0.5-21.6)
Cu	0.952 (<0.5-2.17)	0.913 (<0.5-2.39)
Fe	72.4 (13.3-201)	23.9 (<0.6-114)
K (mg/L)	1.92 (0.025-8.05)	0.742 (<0.01-5.06)
Mn	0.635 (<0.5-3.32)	2.98 (<0.5-11)
Na	169 (<1-1500)	89.2 (<1-295)
Ni	1.03 (<0.5-14.3)	1.01 (<0.5-13.9)
P	3.46 (<1-45.1)	1.19 (<1-9.37)
Pb	<0.5	<0.5
Rb	<0.5	<0.5
Se	<0.8	<08
Sn	<0.5	<0.5
Sr	9.39 (3.86-30.6)	204 (45.8-521)
Ti	<0.5	<0.5
V	<0.5	<0.5
Zn	118 (45-303)	90.2 (15.7-448)

All values are in μg/L unless otherwise noted

3.2.2 Discussion

The limestone dissolution experiment was performed on small limestone columns, using simulated rainwater with a low pH (4.9) and a low electrical conductivity (13 μS/cm) under atmospheric conditions in a laboratory setting. The total metal results clearly show that one of the limestone materials is calcitic in nature with very little Mg, whereas the other is dolomitic in nature containing around 14% Mg w/w (Table 6). The amount of Ca and Mg leached from the limestone samples by the ‘rain’ reflects this difference in mineral composition, with more Mg dissolving under the simulated rainfall from the dolomitic limestone (Table 9).

There are several factors which can influence the dissolution of both calcitic and dolomitic limestones in this experimental setup: (1) the composition of the limestone (be it dolomitic or calcitic, and the amount of non-carbonate material such as quartz), (2) the particle size of the limestone particles (surface area, and relative particle size change over time), and (3) the chemical interactions between the simulated rainfall and the limestone surface.

The calcitic and dolomitic limestone used for this study have similar concentrations of carbonate and non carbonate material. Size distribution is important for understanding the dissolution rate of limestone, particle size having a large influence on solubility (Elphrick, 1955; Swartzendruber & Barber, 1965; Warfvinge & Sverdrup, 1988; 1989). The size distribution cannot account for the observed difference in dissolution rates between calcitic and dolomitic limestones since the distribution patterns for both are very similar (Figure 7). Therefore, the dissolution of both limestones must be more dependent on the differences between the rates of mineral calcite and dolomite dissolution, and not on the amounts of impurities in each sample.

Since the simulated rainwater used for the dissolution experiment is pH 4.9, the dissolution rate of limestone in this study can be discussed in the context of acid rain. If the acid rain causes the pH of the solution to rise to less than 6, carbonic acid species dominate the carbonate equilibrium distribution. The dissolution of both calcite and dolomite increases the pH of the solution from 4.9 to 6-8 (Figure 9), indicating the leachate should contain mostly bicarbonate species early in the experiment when the pH is higher, and a mixture of bicarbonate and carbonic acid species towards the end of the experiment when the pH decreases. There is very little difference between the pH of the calcite and dolomite solutions (Figure 9).

The dissolution of Ca from the calcitic material and Ca and Mg from the dolomitic material under acid rain conditions can be controlled by ‘karstic dissolution’, dry deposition (dissolution caused by gaseous pollutant reactions) and wet deposition of pollutants (acid rain) (Cardell-Fernandez, et al., 2002). As this dissolution experiment was performed in the laboratory, dry deposition is not a contributing factor. However, dry deposition can be a large contributor to calcite dissolution under ambient open, atmospheric conditions, especially in an area with high SO_2 and SO_3 atmospheric concentrations (Cardell-Fernandez, et al., 2002). Karstification processes are generally weaker in dolomite than in limestone, reflecting the slower dissolution rate for dolomite compared to calcite (Lui, et al., 2005). The acidity effect is also weaker for dolomite compared to calcite, which would further explain the slower dissolution.

The dissolution model provides quantitative information on the maximal rate at which Mg and/or Ca ions will be added to the soil solution. Figure 8 shows the cumulative amount of Ca and Mg leached compared to the total amount of rainfall added to the samples. The slope of each line of best fit represents the dissolution rate of Ca and Mg for both limestone samples (Figure 8). A simple linear regression analysis fits the data with high R^2 values (Table 7). The first five rain events have a larger slope compared to the remaining rain events (Figure 8), an observation common in other studies, attributed to the dissolution of the initial very fine particles (Elphrick, 1955). The faster dissolution rate at the beginning of the experiment may appear to follow a polynomial trend in which the dissolution rate should decrease eventually, a trend not seen in these data (Figure 8). The current experimental timeline may simply be too short to observe this trend. However, there is strong evidence that once the initial fine particles have been dissolved, the remaining particles will experience equal diameter reduction (Elphrick, 1955). The equal diameter reduction model assumes that the mixture of unequal sized particles of limestone behave collectively as equal size spheres (Elphrick, 1955; Swartzendruber & Barber, 1965). As the larger particles dissolve, their size is reduced and the surface area increases causing larger particles to become the finer particles over time, making the cumulative mass distribution linear between the smallest particles and the largest particle (Swartzendruber & Barber, 1965). The simple model fits the data well and allows for a rough estimate of the time for release of all the limestone dissolution products into solution. The calcitic material will dissolve in approximately 36-40 years, whereas the dolomitic material will dissolve in approximately 80-86 years, using the annual rainfall for Sudbury, Ontario (Table 8). Literature reports indicate that limestone dissolution is faster at lower than at higher pH, with calcite dissolving faster than dolomite under both acidic and non-acidic conditions (Lund, et al., 1975; Warfvinge & Sverdrup, 1988; Morse & Arvidson, 2002; Lui, et al., 2005; Thornbush & Viles, 2007). The timeline given can only be used as a rough estimation because it does not take into consideration other mechanisms which may increase or decrease limestone dissolution, like dissolved Fe and organic carbon levels in the soil solution potentially coating limestone particles, thus inhibiting dissolution (Warfvinge & Sverdrup, 1988). Other environmental factors such as runoff could also reduce the amount of limestone on slopes whilst increasing the amount of limestone in low lying areas. However, the dissolution experiment does show a large discrepancy between the dissolution rate for calcitic and dolomitic limestone, with the dolomitic supplying Ca, Mg, and buffering products to the soil system for twice as long as calcitic limestone.

A comparison of the concentrations of elements in solution (Table 9) with the concentrations in the parent limestone material (Table 6) demonstrates that the total concentration of an element in the limestone will not necessarily determine the concentration of ions in solution. The leachate chemical analysis results from the dissolution experiment are, however, an excellent indication of what will dissolve and enter the soil solution complex. Total elemental analysis of dolomite shows a high concentration of Zn, although the mean amount of Zn leached is very low (less than 100 μg/L). Thus the leachate data show that additional Zn contamination to the Sudbury soils may not be of concern for the dolomitic limestone. This is important from a reclamation perspective because an increase in the amount of contaminants in the soil by the addition of limestone would be far from ideal.

In summary, calcitic and dolomitic limestone have a similar total carbonate content, similar particle size distribution patterns, and induce a similar increase in leachate pH during dissolution, with the dissolution rate for calcitic limestone being twice that of the dolomitic limestone. The increased calcitic material dissolution rate can only be attributed to the reaction of the simulated rainwater with the different carbonate minerals. The impurities measured in the solid limestone materials do not always reflect what actually enters the leachate solution in the timeframe of the experiment, with potential contaminant metals perhaps not easily soluble in the simulated rainwater.

3.3 Movement of calcium, magnesium, and inorganic carbon through soil mesocosm

The movement of Ca, Mg, and inorganic carbon through the soil is of primary importance to this study. The dissolution of calcitic and dolomitic limestones releases a large amount of Ca and possibly Mg ions, as well as inorganic carbon species into the soil solution. The movement of these dissolution products gives insight into their interactions with the soil complex. The movement of Ca and Mg ions and the change in pH through the soil mesocosms during leaching will be presented and discussed in this section. The mobility of inorganic carbon species through the soil profile during the leaching experiment will also be presented and discussed in this section.

3.3.1 Results

Soil mesocosm leachate results show the movement of Ca and Mg ions through the soil profile over time. There is a higher concentration of Ca in the leachate sampled by grav. A (LFH-Ae interface) and ten. B (Ae-Bf interface) in the columns amended with calcitic limestone compared to the control and dolomitic limestone-amended columns (Figure 10). Initially there is a very large amount of Ca which is leaching from the calcitic limestone amended column with vegetation under the LFH horizon, with concentrations up to almost 50mg/L of Ca in solution (Figure 10). This initial spike is not seen, however, for the calcitic limestone amended column without vegetation, even though the columns with and without vegetation are identical until seeding on day 42 (Figure 10). Dolomitic limestone dissolution releases a mean concentration of 4.91 mg/L of Ca into solution during each rain event (Table 9), but this has little effect on the actual concentration of Ca in solution under the dolomite amended columns (Figure 10). Another interesting reoccurring trend is a spike in the concentration of Ca leached from ten. B (5cm) for the calcitic and dolomitic limestone amended columns following seeding, a trend not observed for the unseeded columns (Figure 10). An increase in Mg concentration in the leachate is observed for dolomitic limestone amended columns with and without vegetation, however, the leachate compositional pattern varies (Figure 11). The dolomitic limestone column without vegetation shows a steady increase in the concentration of Mg in solution throughout the experiment, whereas the dolomitic limestone amended column with vegetation shows a spike in Mg for grav. A and ten. B and C around the time of seeding (Figure 11). The dissolution of calcitic limestone releases small amounts of Mg into solution, with no increase in Mg release to the solutions under the LFH horizon for calcitic limestone amended columns (Figure 11). However, there is a spike in the concentration of Mg leached from the calcitic limestone amended column with vegetation around the time of seeding for ten. B and C, and grav. D. (Figure 11).

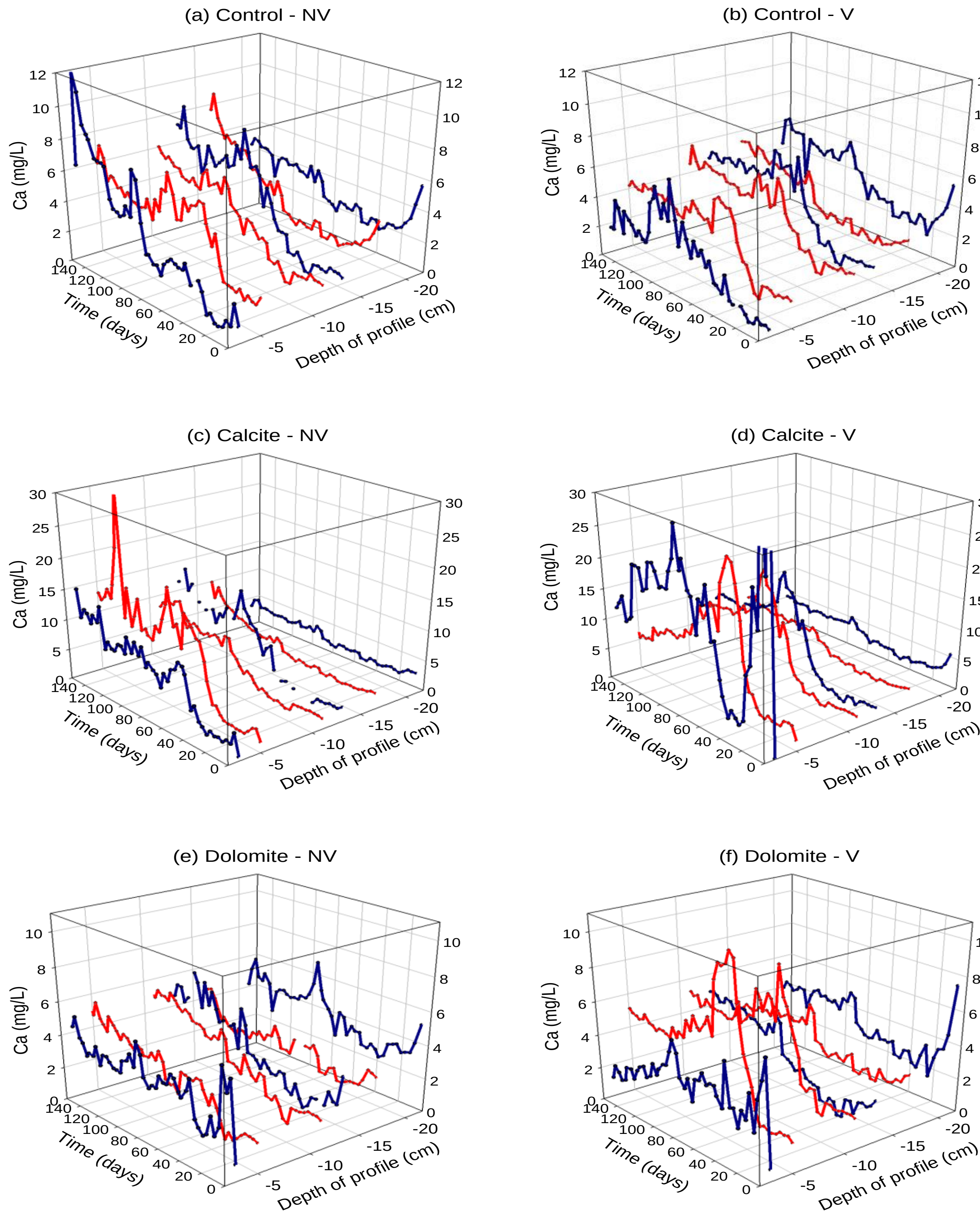

Figure 10: Calcium dissolution through soil mesocosms over time:
(a) control column, without vegetation, (b) control column, with vegetation, (c) calcite amended column, without vegetation, (d) calcite amended column, with vegetation , (e) dolomite amended column, without vegetation, (f) dolomite amended column, with vegetation. All values are in mg/L. Blue lines represent gravitational lysimeters, red lines represent tension lysimeters.

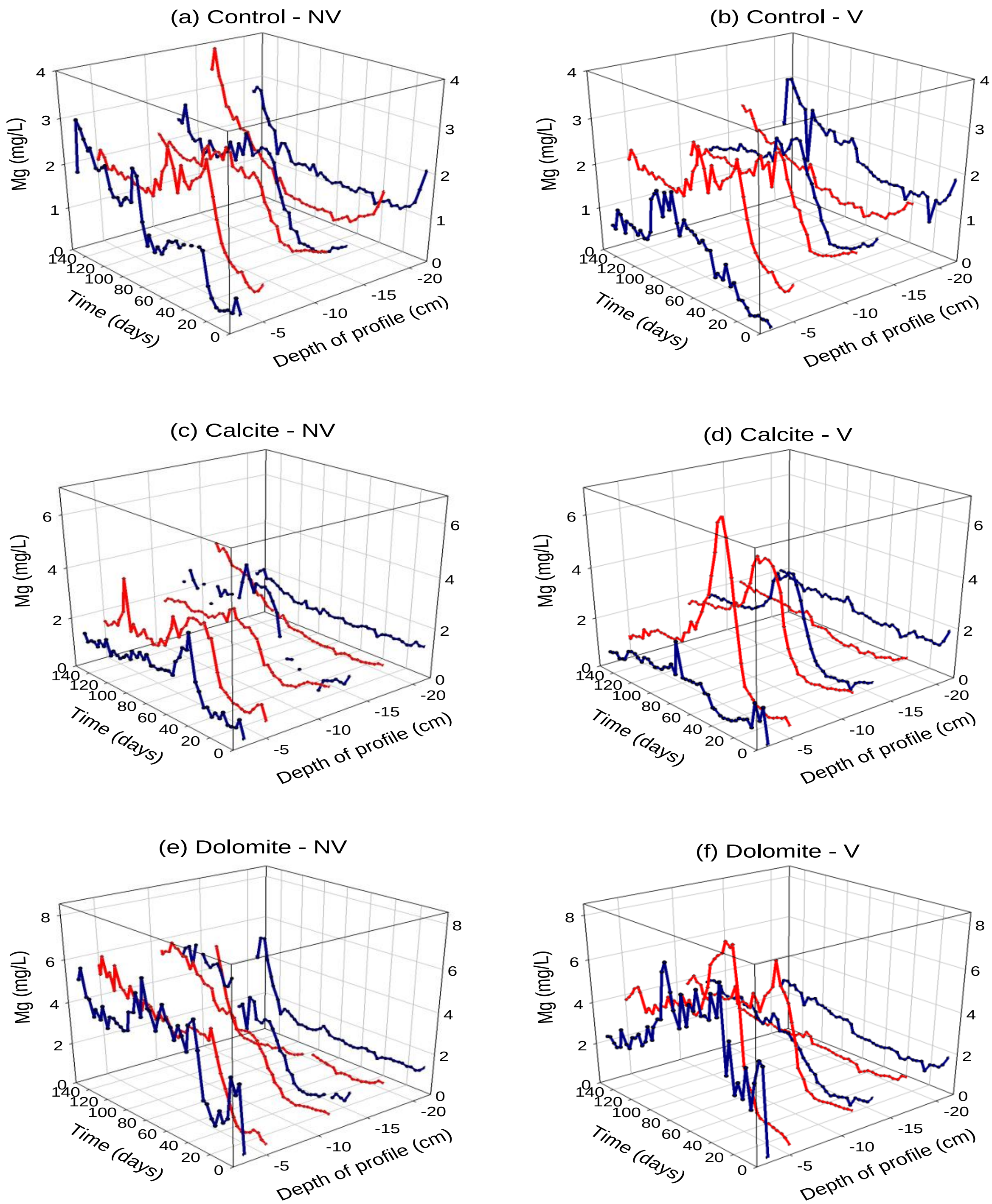

Figure 11: Magnesium dissolution through soil mesocosms over time:

(a**) control column, without vegetation, (b) control column, with vegetation, (c) calcite amended column, without vegetation, (d) calcite amended column, with vegetation , (e) dolomite amended column, without vegetation, (f) dolomite amended column, with vegetation. All values are in mg/L. Blue lines represent gravitational lysimeters, red lines represent tension lysimeters.**

The mean Ca and Mg concentration in the leachate samples is useful to estimate the migration depths down the soil profile for these dissolution products. Figure 12 shows that there is a higher concentration of Ca migrating in solution under the calcitic limestone amended columns, down past the bottom of the Bf horizon (13cm). The same trend is seen for Mg for the dolomitic limestone amended column with a downwards migration of Mg to the top of the BC horizon (13cm) (Figure 12). There is no increase in Ca leached from the dolomite column compared to the control, even at the top of the soil profile where the liming took place (Figure 12). Dolomitic limestone should increase the amount of Ca in solution, especially in the top of the soil profile, since the dissolution of dolomitic limestone releases a mean of 4.91 mg/L of Ca into solution during each rain event, an expectation not observed in the data (Table 9).

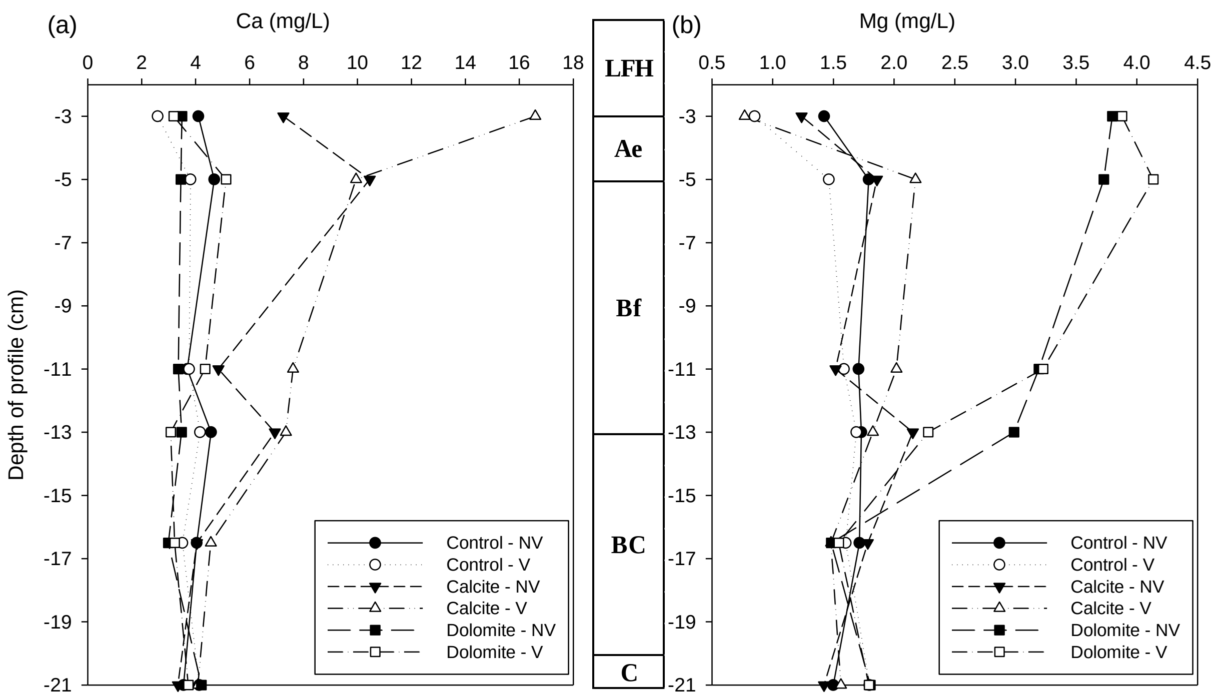

Figure 12: Mean leachate concentration of Ca (a) and Mg (b) for all soil mesocosms.

After the rainfall simulation experiment was completed, the soil matrix samples showed an increase in the amount of total and bioavailable Ca in the surface of the LFH horizon for both calcitic limestone and dolomitic limestone amended columns (Figure 13). The total and bioavailable concentration of Mg in the top LFH horizon was highest in the dolomitic limestone amended columns (Figure 13). Although the mean leachate concentrations showed that more Ca

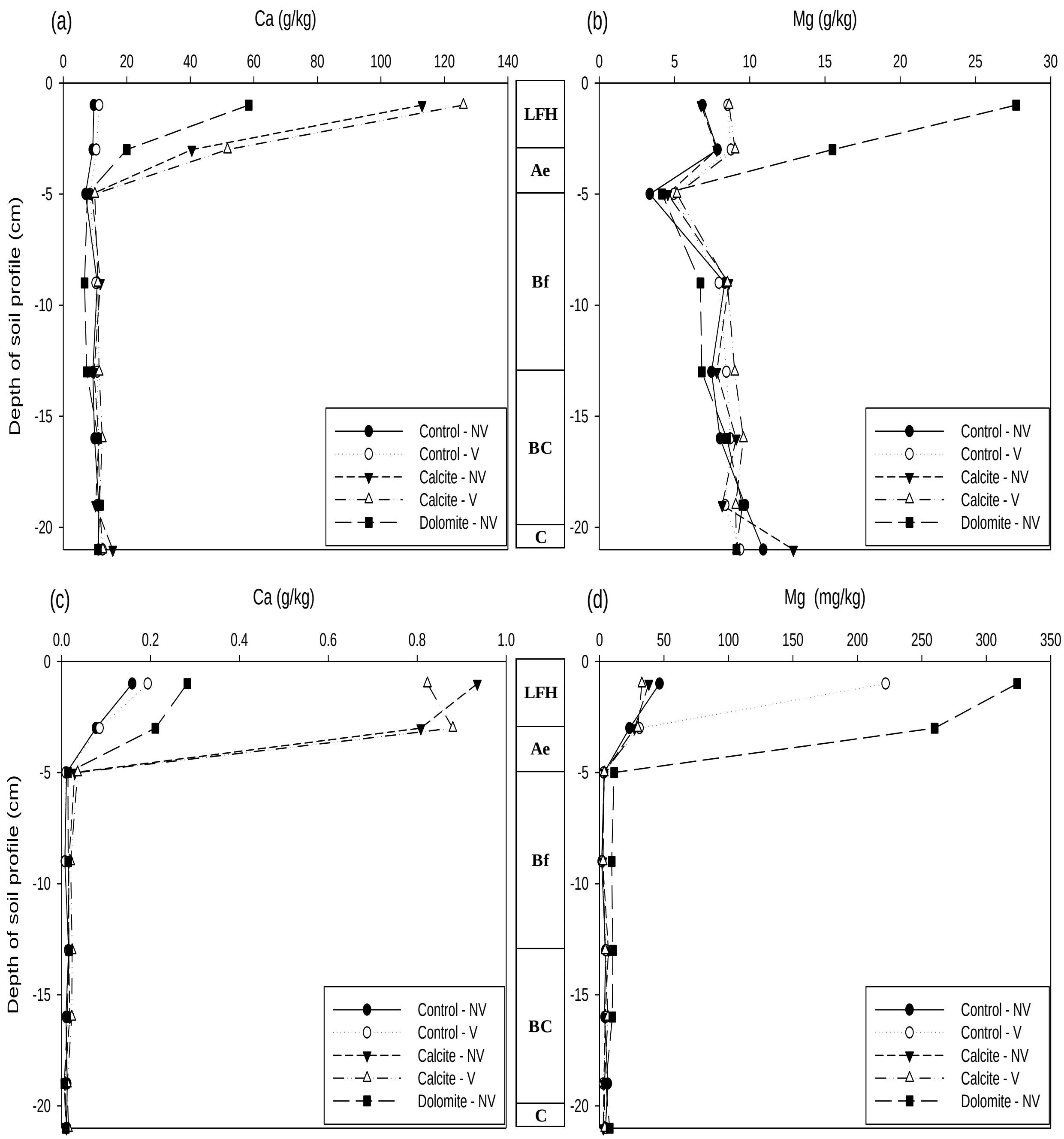

Figure 13: Concentration of calcium and magnesium in the solid samples after mesocosm leaching:

(a) total calcium, (b) total magnesium, (c) bioavailable calcium, (d) bioavailable magnesium.

and Mg are leached from calcitic and dolomitic limestone amended columns respectively, down to the Bf and BC mineral horizons, the soil matrix data only show an increase in these metals in the top 5cm of the soil (Figure 12; Figure 13).

The pH of the soil solution collected during the mesocosm experiment only shows a large increase due to liming in the top sampling location (grav. A), directly under the LFH horizon (Figure 14). These trends are observed throughout the duration of the leaching experiment in Figure 15. Figure 15 also shows that the leachate pH in grav. A for the limed columns with vegetation is initially high but decreases over time. This decrease in pH over time can be found for ten. B and C for all soil mesocosms, with the difference in pH between columns becoming relatively small. For example, for leachate samples from ten. C, there is no change in pH due to liming or vegetation, but the pH for all soil mesocosms decreases from around pH 5 at day 0-20 to pH 4.5 at day 80-172 (raw data available in appendix Table 13). The pH is slightly elevated in ten. B, with the difference between control and limed columns being about 0.5 pH units for the dolomitic limestone columns and calcitic limestone column with vegetation (Figure 14). There is a large variation between the pH for the calcitic limestone amended columns with and without vegetation, with the calcitic limestone column without vegetation showing very little change in pH compared to the control, and the calcite column with vegetation showing the largest pH increase in the top of the soil profile (Figure 14). This observation may be due to an uneven distribution of the calcitic limestone on the surface of the column at application.

The pH and the inorganic carbon content of the residual soil materials after the leaching experiment shows that both calcitic limestone amended columns have an increase in pH, with a large amount of un-dissolved residual limestone present (Figure 16). An increase in pH in the soil solution and the soil matrix from the LFH horizon is also observed in dolomitic limestone amended columns (Figure 14; Figure 16). The dolomitic limestone amended column also has a large amount of un-dissolved residual limestone present in the LFH horizon (Figure 16). There is more residual inorganic carbon on the dolomitic limestone amended column than on the calcitic limestone amended columns (Figure 16). The actual amounts of inorganic carbon in the LFH horizons indicate that, of the total amount of limestone materials originally added to the soil column, the calcitic limestone columns without and with vegetation had 9.36 and 9.48 % of total limestone remaining respectively, and the dolomitic limestone column without vegetation had

26.3 % of total limestone remaining after the mesocosm experiment. The inorganic carbon, indicative of un-dissolved limestone materials, is only found in the upper section of the LFH horizons and therefore did not migrate into the mineral horizons (Figure 16). Both calcitic limestone columns showed a decrease in inorganic carbon content from the top section of the LFH horizons to the lower section (2-3cm) of the LFH. The dolomitic limestone column showed an increase from the top 1cm to the bottom 2cm (Figure 16). The control column with vegetation was found to have a higher than expected concentration of bioavailable Mg and also a small amount of inorganic carbon on the surface on the LFH horizon (Figure 13d; Figure 16b).

3.3.1.1

Vegetation growth

Liming improved the growth of both natural vegetation in the LFH seed bank and the grass which was planted. Full spectrum lights were used to promote vegetation growth over all soil mesocosms. Figure 17 shows the vegetation growth at the end of the leaching experiment for all soil mesocosms.

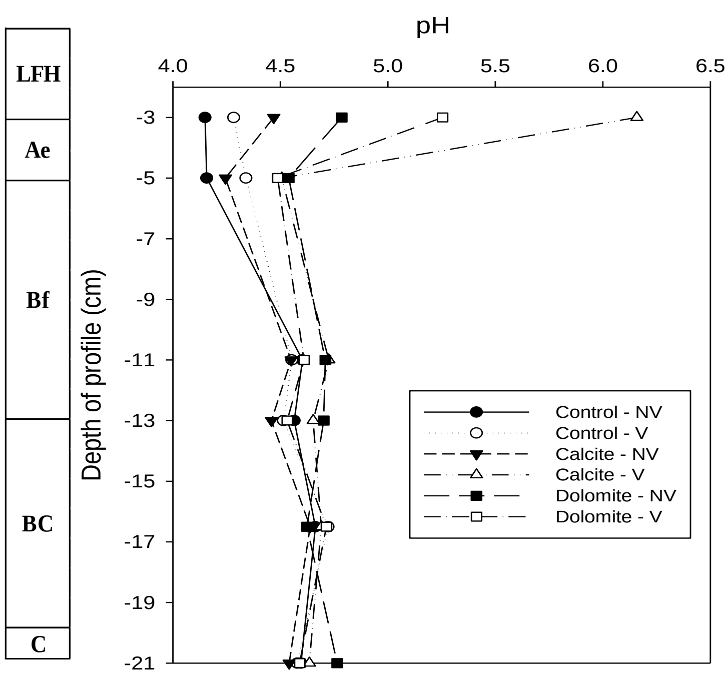

Figure 14: Mean pH of soil mesocosm leachate samples.

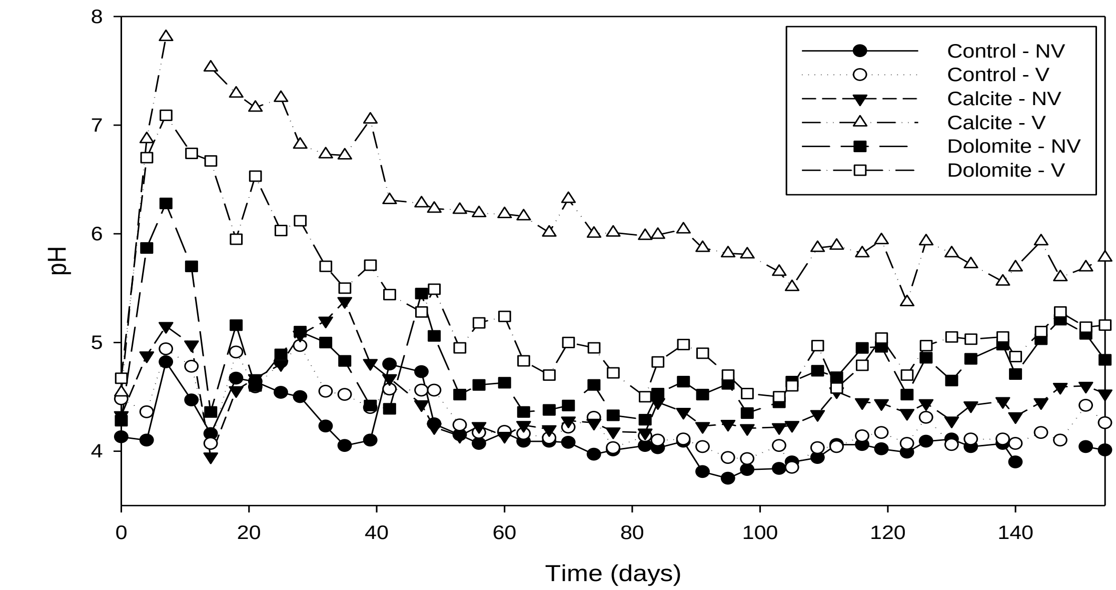

Figure 15: pH leachate results for Port A (directly under LFH horizon) for all soil mesocosms.

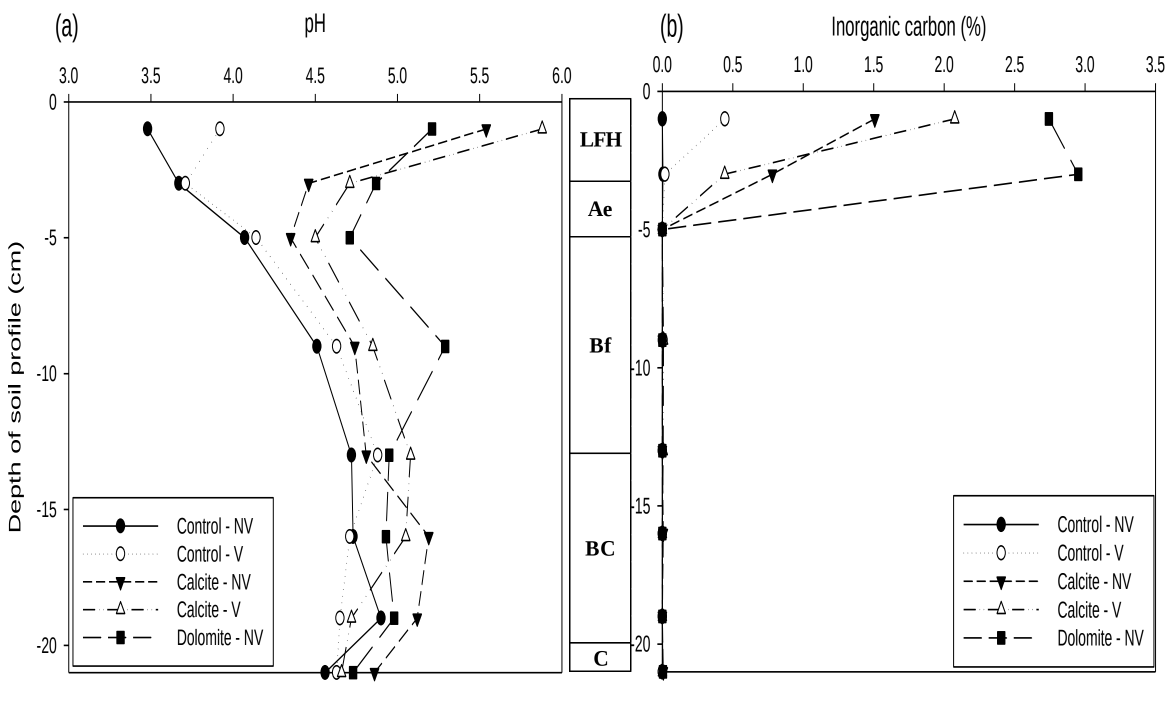

Figure 16: pH (a) and inorganic carbon (b) of solid soil material after leaching experiment.

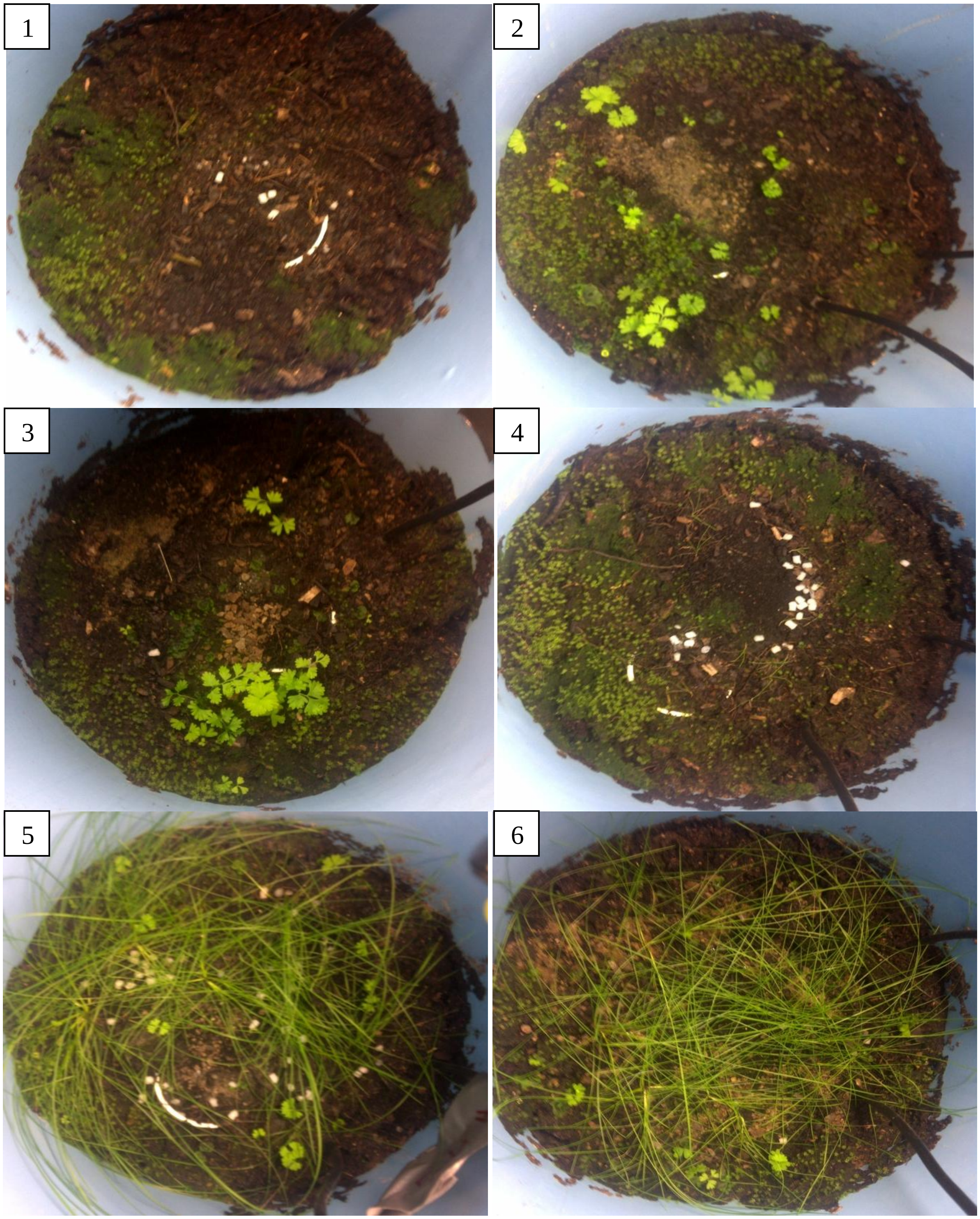

Figure 17: Vegetative growth on soil mesocosms at end of leaching experiment (day 154). Columns 4-6 were seeded with tickle grass. Soil mesocosm number is indicated in top left corner of each image.

3.3.2 Discussion

The investigation of the movement of Ca, Mg, and inorganic carbon species in solution through the soil as a result of liming is extremely important for this study because they are the main dissolution products of limestone. When limestone is added to the soil for reclamation (or agricultural) purposes, the main goal is to increase the amount of Ca and Mg in the soil solution, while also increasing the soil pH. Most reclamation studies using lime as an amendment focus on the immobilization of contaminants and the change in pH, in reality very important aspects of liming, but overlook examining how the actual dissolution products of limestone interact with the soil exchange complex.

The movement of Ca and Mg through the soil profile is greatly affected by the addition of limestones containing either calcite or dolomite to the top of the soil profile. All the soil material in each column is the same, with the only variations being the additions of calcitic or dolomitic limestone spread on the top of the column at a rate of 10 t ha^{-1}, and in the seeding of tickle grass on representative columns at day 42 of the study. Therefore, any trends in the data can only be attributed to the addition of limestone, the addition of vegetation, or both.

3.3.2.1 Effect of liming

Liming increases the concentration of Ca (calcitic limestone amended columns) and Mg (dolomitic limestone amended columns) in solution in the top 13cm of soil, from the LFH horizon to the Bf-BC interface (Figure 10; Figure 11; Figure 12). Dolomitic limestone amended columns had no affect on the concentration of Ca in solution. We would expect dolomitic limestone amended columns to have an increase in Ca in solution due to the large amount of Ca in the limestone (~24 wt%). Other studies have shown that dolomite or Mg-rich limestone increases the concentration of Ca and Mg in the soil solution at depths of 20-30cm (or below at least one B mineral horizon) (Schreffler & Sharp, 2003; Lundell, et al., 2001; Derome & Saarsalmi 1999), and as far down as 40-60cm (Cifu, et al., 2004). This is in sharp contrast to the results of this study, which show that dolomite does not increase the concentration of Ca in the soil solution, even at a depth of only 3cm (Figure 11, Figure 12b). A study by Ingerslev (1997) used both a mixture of calcite with magnesium sulphate and dolomite and only found an increase in Ca and Mg in solution for plots amended with the calcite-$MgSO_4$ mixture and not the dolomite. The lack of increased Ca in dolomitic limestone amended columns may be in part explained due to natural soil solution variability common in soil chemistry research (Schreffler & Sharp, 2003).

Unlike soil leachate data, soil matrix data are less variable because usually larger soil samples are homogenised before being analysed, and are therefore more representative of the whole soil and not only a small portion of the soil solution. The addition of calcitic limestone increased the total and bioavailable concentration of Ca in the surface section of the LFH horizon of the soil but did not add any measureable Mg to the soil (Figure 13). The dolomitic limestone amended columns caused an increase in the total and bioavailable concentration of both Ca and Mg in the LFH horizon (Figure 13). Only the LFH horizon showed an increase in total and bioavailable Ca and Mg, an observation typical for limed soils from the Sudbury region (Nkongolo, et al., 2013). The experimental observation that the addition of dolomitic limestone did not increase the concentration of Ca in solution but did increase the total and bioavailable concentrations of both Ca and Mg in the LFH horizon is important for the reclamation process in Sudbury because dolomitic limestone was initially chosen to add both Ca and Mg to the soil landscape system. The addition of both Ca and Mg to the soil system is greatly needed in areas of erosion, nutrient imbalance, and nutrient loss (Winterhalder, 1995; Winterhalder, 1996; Nkongolo, et al., 2013).

Liming increased the pH in the percolating solutions and in the solid matrix material in the top 5cm of the soil, with the largest increase in pH found in the top 1-3cm (Figure 14; Figure 16a), an observation consistent with other Sudbury area studies (Winterhalder, 1995; Winterhalder, 1996; Nkongolo, et al., 2013). The pH of the soil matrix material is increased to above the Sudbury re-greening target of 5.5 for the calcitic product (although dolomitic limestone is close at pH>5), and then only for the very top section of the LFH horizon (Figure 16a). From 1-3cm in the LFH horizon the pH drops a full pH unit for the calcitic limestone amended columns, and approximately half a pH unit for the dolomitic limestone column. These results suggest that, although liming did increase the pH, the pH of the entire LFH horizon was not elevated to over the target values of pH 5.5 but is approaching the minimum target value of >5.0 (Lautenbach, et al., 1995). Recent studies conducted on Sudbury soils found that the pH of some sites remained elevated (pH>6), even 30 years after liming, while other sites showed some to no elevation in pH compared to the control (Juckers, et al., 2013; Nkongolo, et al., 2013). The larger increase in pH at the very top of the LFH horizon may reflect the presence of un-dissolved limestone particles.

The smaller increase in pH for the balance of the LFH horizon is perhaps due to the precipitation of Fe^{3+} as $Fe(OH)_3$ by the bicarbonate and hydroxide species released from limestone dissolution (eq. 10) (Derome & Lindroos, 1998; Derome, 2000). When this reaction occurs, large amounts of Ca, and potentially Mg, are released from the limestone, with little acidity reduction in the organic layer. The concentration of Fe_{total} in the LFH horizon is very high (5.9%), a reflection of high concentrations of magnetite-rich aerosolic particles (Langteigne, et al., 2012). These reactions are most likely occurring not only with dissolved Fe but also with other metals like Ni and Cu (eq. 11) (Derome, 2000). Soluble Al^{3+} may also be reacting with $CaCO_3$ leading to increased H^+ desorption, which in turn causes an increase in proton acidity and could help explain a smaller than expected increase in pH (eq. 12 and 13).

The addition of limestone did not have a large effect on overall ionic strength of the soil leachate or the soil matrix data (see appendix Table 13 and Table 17). In contrast, the oxidation/reduction potential of the LFH horizon was affected by liming. The addition of both calcitic and dolomitic limestone decreases the redox potential of the soil in the top 3cm, from approximately 550 mV in the control to approximately 450 mV in amended columns (see appendix Table 13 and Table 17). The observation may be linked to the addition of limestone increasing soil solution pH, which in turn increases microbial and rhizobial activity (Fettell, et al., 2007; Levonmaki & Hartikainen, 2007), leading to a reduction in the redox potential (Patra & Mohanty, 1994).

The calcitic and dolomitic limestone materials did not completely dissolve during the duration of this experiment, with solid limestone material being observed on the top of all limed columns. As with the migration of Ca and Mg in the solid soil material, inorganic carbon residues are only found in the top LFH horizon and therefore the added limestones did not migrate into the mineral horizons (Figure 16b). Figure 16b also demonstrates that there is more inorganic carbon present in the dolomitic column compared to the calcitic columns which is reflective of the slower dissolution rate of dolomite compared to calcite. The slower dissolution of dolomite will increase the longevity of Mg and Ca and carbonate species release to the soil solution to twice as long as calcite (Table 8). Winterhalder (1995) hypothesised that, even after the neutralization provided by the dissolution of limestone is exhausted, the amount of available Ca and Mg in the top 5cm of the soil will remain high due to “cation pumping” by vegetation in which cations that migrated into the soil are returned to the leaves by the nutrient uptake of the surface roots, which can penetrate into large volumes of soil (Aber, 1987). These leaves that have taken up the cations then fall during senescense or death and are decomposed and cycled through the soil system, becoming available again for plant uptake. Addition of dolomitic limestone instead of calcitic limestone, as an amendment will increase the time for the limestone to dissolve, thereby allowing more time for a stable forest ecosystem with potential cation pumps and a healthy decomposer community to establish (Winterhalder, 1995; Aber, 1987).

3.3.2.2 Effects of vegetation and liming

Both seeded and unseeded columns had vegetation development, with the vegetation growing best on limestone amended columns. The unseeded columns grew moss and clovers from the natural seed bank. Tickle grass did not grow well on the control seeded column, with the moss and clover observed on limed unseeded columns only established in very small amounts in the unseeded control column. The limestone additions to the soil clearly increased vegetation growth, presumably due to their neutralizing and detoxifying effect on acidic, metal contaminated soil (Winterhalder, 1996).

Vegetative growth, either alone or combined with liming, seems to have little to no effect on the mean downward migration of Ca, Mg, inorganic carbon or pH through the soil profile, but does affect the pattern of Ca and Mg in the soil solution. The spike in Ca and Mg concentrations observed for ten. B and C on the vegetated columns is related to both the growth of the tickle grass and the dissolution of limestone (Figure 10; Figure 11). The spike between day 40 and day 80 is largest under the calcitic limestone column, and only slightly discernible for the control column (Figure 10; Figure 11). Full spectrum lights were turned on and the vegetation was planted on day 42. As full spectrum lights were installed over all columns, only the addition of the planted vegetation can explain this spike in elemental leaching behaviour. Ten. B and C lysimeters sample the pore water after the rainwater and limestone dissolution products interact with the exchange complex. The most likely explanation for this spike in Ca and Mg is that after 40 days the exchange complex of the organic material in the LFH horizon is saturated in Ca from calcitic and Mg from dolomitic limestones, releasing these ions into solution as new dissolution products are added to the exchange complex from the percolating solutions. This exchange is promoted or enhanced by the growth of the planted grass. The control column with vegetation also shows a slight spike in ten. B and C once the grass is planted, further demonstrating that vegetation growth alone, possibly as a result of root exudates production, can cause the exchange of Ca and Mg from the exchange complex to the soil pore water. The unvegetated limed and control columns demonstrated a slight increase in Ca and Mg leached beginning at day 40, possibly associated with vegetation growth encouraged by the illumination with the full spectrum lights enhancing the vegetation growth from either the natural seed bank or from planted seeds. This short-term increase in metal ions in solution after liming is attributed to large amounts of base cations being released into the soil solution following the dissolution of limestone, which in turn would cause displacement of other metals (Derome & Saarsalmi, 1999). The growth of vegetation may be a necessary component for this increase observed in other studies. Of note is the fact that the mean concentrations of Ca and Mg were not greatly affected by vegetation, only their leaching patterns. This spike in concentration is also observed for other elements discussed in sections described below.

3.3.2.3 Unexpected results

In general, the addition of both types of limestone increased the soil solution pH and the organic soil materials in the LFH horizon (Figure 14; Figure 16a). However, this increase in pH is variable for the calcitic limestone amended columns. The pH of the leachate is relatively unchanged in the calcitic limestone column without vegetation, even in the top sampling point (a gravitational lysimeter) located at the LFH-Ae horizon interface (Figure 14). This large difference between the leachate pH for calcitic limestone amended columns with and without vegetation may be due to uneven limestone application on the soil surface, a condition which could explain the lower mean concentration of Ca in the grav. A solutions of the unvegetated calcitic limestone column (Figure 12a). Other studies have shown that, even years after liming, soil pH is not always uniform with small areas still having a low pH (Reid, 1996). Although the soil solution results may be variable depending on a combination of limestone spreading variability and sampling location, the soil matrix data is much more uniform. This reinforces the hypothesis that non-uniform spreading caused the variation in the data between calcite columns with and without vegetation. The total and bioavailable Ca and Mg, as well as the soil pH and inorganic carbon content, are very similar between calcitic limestone columns with and without vegetation (Figure 13a,c; Figure 16). Future studies should be mindful of the potential variability and sample pore water at many locations if possible.

The observation that the addition of dolomitic limestone does not increase the concentration of Ca ions in solution (Figure 10c,d; Figure 12b) is surprising. Although the limestone dissolution experiments show that a mean concentration of 4.9mg/L of Ca is potentially released from dolomitic limestone by the simulated rainwater during each rain event, the concentration of Ca in the soil profile leachate is not increased (Table 9). The mean leachate concentration of Ca in the grav. A and ten. B for the dolomitic amended columns is approximately 2-4 mg/L. Therefore, either the dolomitic limestone is not dissolving as much Ca in the soil as predicted from the dissolution experiment, or the uneven distribution of the limestone causes the top gravitational lysimeter (A) to "miss" the free flowing Ca dissolved by the rainwater. The solid soil results show that dolomitic limestone does increase the total and bioavailable concentrations of Ca (Figure 13a,c), the pH of the leachate and the soil matrix (Figure 14; Figure 16a), and the inorganic carbon content in the top LFH horizon (Figure 16b). Therefore, the addition of dolomitic limestone increases the amount of Ca in the soil, but the actual concentration of Ca in the pore water is variable. Future studies should be mindful of this inherent variability and sample pore water at many locations, if possible (i.e., for field experiments).

Another unexpected result is the increased amount of bioavailable Mg and inorganic carbon in the control column with vegetation (Figure 13d; Figure 16b). Although there is no inorganic carbon present in the original soil material as collected, Figure 16b shows that the vegetated control column has 0.5% inorganic carbon (detection limit 0.004 %). In the leachate data for Ca, Mg, and pH, the two control soil columns are fairly consistent, which leads to the hypothesis that the control column with vegetation was perhaps contaminated, possibly with a small amount of dolomitic limestone, during the column decommissioning, after the leaching experiment was completed. The soil matrix pH also increased approximately 0.5 pH units for the vegetated control column (Figure 16a). This contamination only appears to be present in the very top of the LFH horizon, which is where the contamination would have taken place. This observation is important to note to aid in the understanding of the bioavailable concentration of metals in the top of the LFH soil horizon, discussed in subsequent chapters.

3.3.2.4 Summary

Liming with calcitic limestone increases the concentration of Ca in solution. The Ca released from limestone dissolution migrates to the bottom of the Bf horizons, but not through the BC horizon. Calcitic limestone addition also greatly increases the total and bioavailable concentrations of Ca in the soil matrix after leaching, but this increase is only observed in the upper section of the LFH horizon.

Dolomitic limestone increases the concentration of Mg, but not the concentration of Ca in the leachate. The Mg ions released from dolomitic limestone dissolution migrate to the bottom of the Bf horizon, but not through the underlying BC horizon. Dolomitic limestone increases the total and bioavailable concentrations of Ca and Mg in upper section of the LFH horizon.

Liming with either calcitic or dolomitic materials increases the pH in the top 5cm of soil and decreases the measured E_H in the top 3cm of the soil. After a simulated year of liming, the soil columns with the calcitic and dolomitic limestone additions have approximately 9.5 % and 26.3 % of total limestone remaining on the soil surface, respectively. Liming also increased vegetation growth in both seeded and unseeded columns compared to control columns.

3.4 Movement of chemicals of concern through soil mesocosm

As shown in Table 3, the soil used for this study is highly contaminated in most of the chemicals of concern as outlined by the Sudbury Soil Study, with concentrations of As, Cd, Co, Cu, Ni, Pb, and Se in the LFH horizon that are above MOE guidelines (Wren, et al., 2012). One of the main goals of the Sudbury reclamation program was (and still is) to reduce the potentially toxic effects of these metals by liming. Therefore, the movement of these metals and the effect liming has on the movement of these metals through the soil column is of interest in this study. The behaviour of Zn, an important micronutrient, will not be discussed in this section because the soil is not contaminated with it, according to the MOE guidelines (Table 3). Iron and Al are included in this section because: (1) the concentration of both elements is very high in the soil, (2) Fe is deposited onto the soil surface in spherical particles emitted from smelting activities (Langteigne, et al., 2012) and (3) soluble Al can be highly toxic and mobile at low pH (Winterhalder, 1995). The movement of chemicals of concern, along with Fe, and Al through the soil mesocosms during leaching, and also the change in these parameters in the soil matrix material after the leaching experiment was completed, will be presented and discussed in this section.

3.4.1 Results

3.4.1.1 Nickel and copper

The movements of Cu and Ni ions in solution through the soil profile under limed and unlimed conditions are of particular importance for this study because the surface horizon of the pedon is highly contaminated in both these metals (13 times and 64 times the MOE guidelines, respectively) (Table 3). As the bioavailable concentrations of both Cu and Ni are also high in the top soil horizon, their potential mobility is greater than for many of the other chemicals of concern (Table 4).

The concentration of Ni in the leachate through the soil profile and over time for all soil mesocosms can be seen in Figure 18. When the leachates sampled by grav. A (located at the LFH-Ae horizon interface) are compared, there is less Ni leached from the calcitic and dolomitic limestone amended columns than from the control columns (Figure 18). This reduction in potentially mobile Ni is more drastic for the vegetated limed columns than for the unvegetated limed columns. Nickel is also slightly more potentially mobile in the unvegetated control column compared to the control column with vegetation (Figure 18). Figure 18 also shows a large spike in the concentration of Ni leached from the vegetated calcitic limestone amended column between days 40 and 80. This increase is noticeable for most of the columns, control and limed, but is much more pronounced for the vegetated calcitic limestone column.

The concentrations of Cu leached from the upper three sampling locations (grav. A, and ten. B and C) are shown in Figure 19. Only the top three sampling locations are shown because the concentration of Cu in solutions from lower ports is very low and does not vary between column types (Figure 20b). In contrast to its effect on Ni, liming seems to have little effect on the concentration of Cu in solution, even in the top 3 sampling locations (Figure 19). Although the spike in the vegetated calcitic limestone column can still be observed for ten. B from around day 40-80, it is much less pronounced than for Ni (Figure 19b). From ten. B to C there is a consistent ten times reduction in the concentration of Cu in solution for all soil mesocosms (Figure 19b,c).

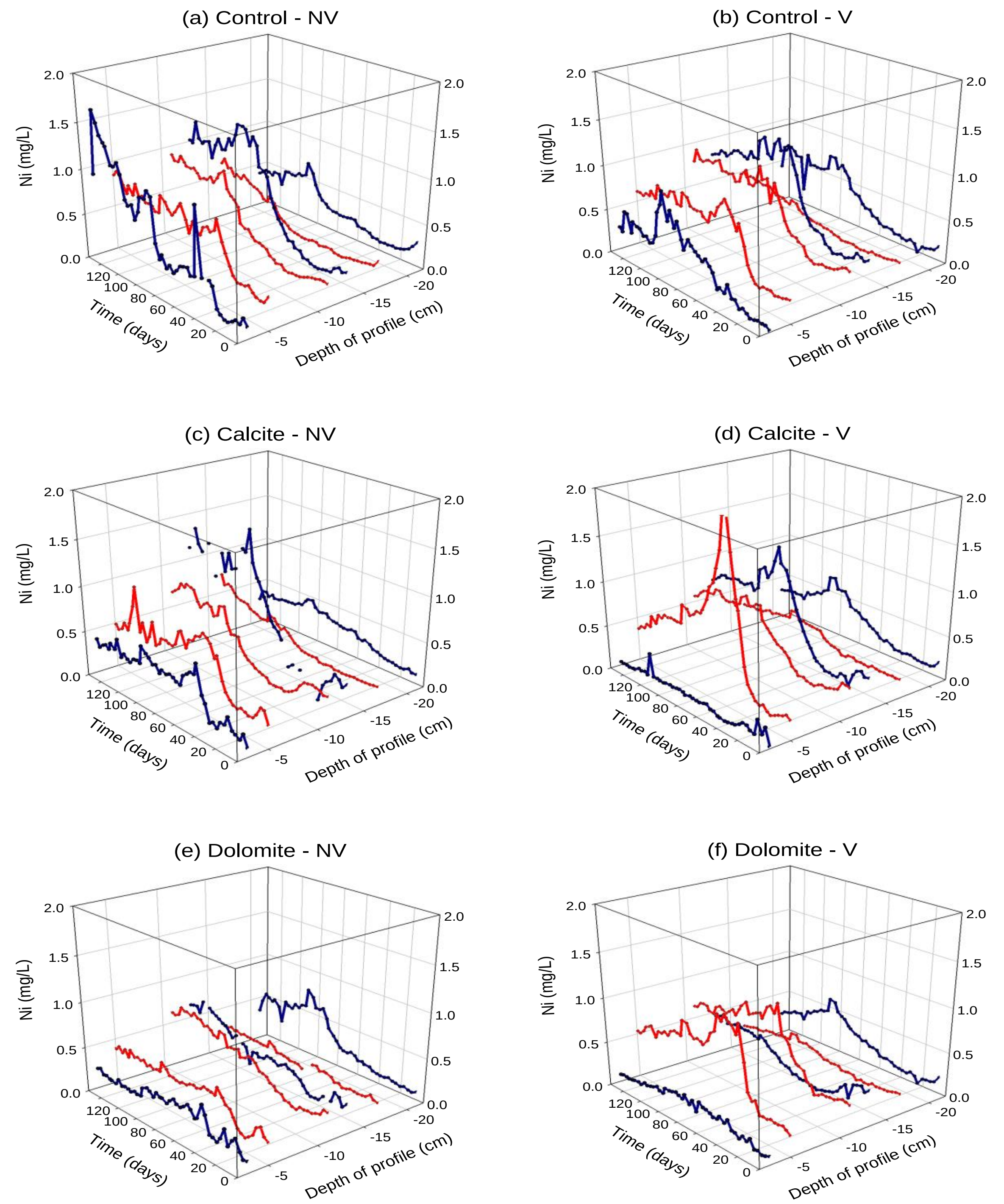

Figure 18: Nickel dissolution through soil mesocosms over time:

(a) control column, without vegetation, (b) control column, with vegetation, (c) calcite amended column, without vegetation, (d) calcite amended column, with vegetation , (e) dolomite amended column, without vegetation, (f) dolomite amended column, with vegetation. All values are in mg/L. Blue lines represent gravitational lysimeters, red lines represent tension lysimeters.

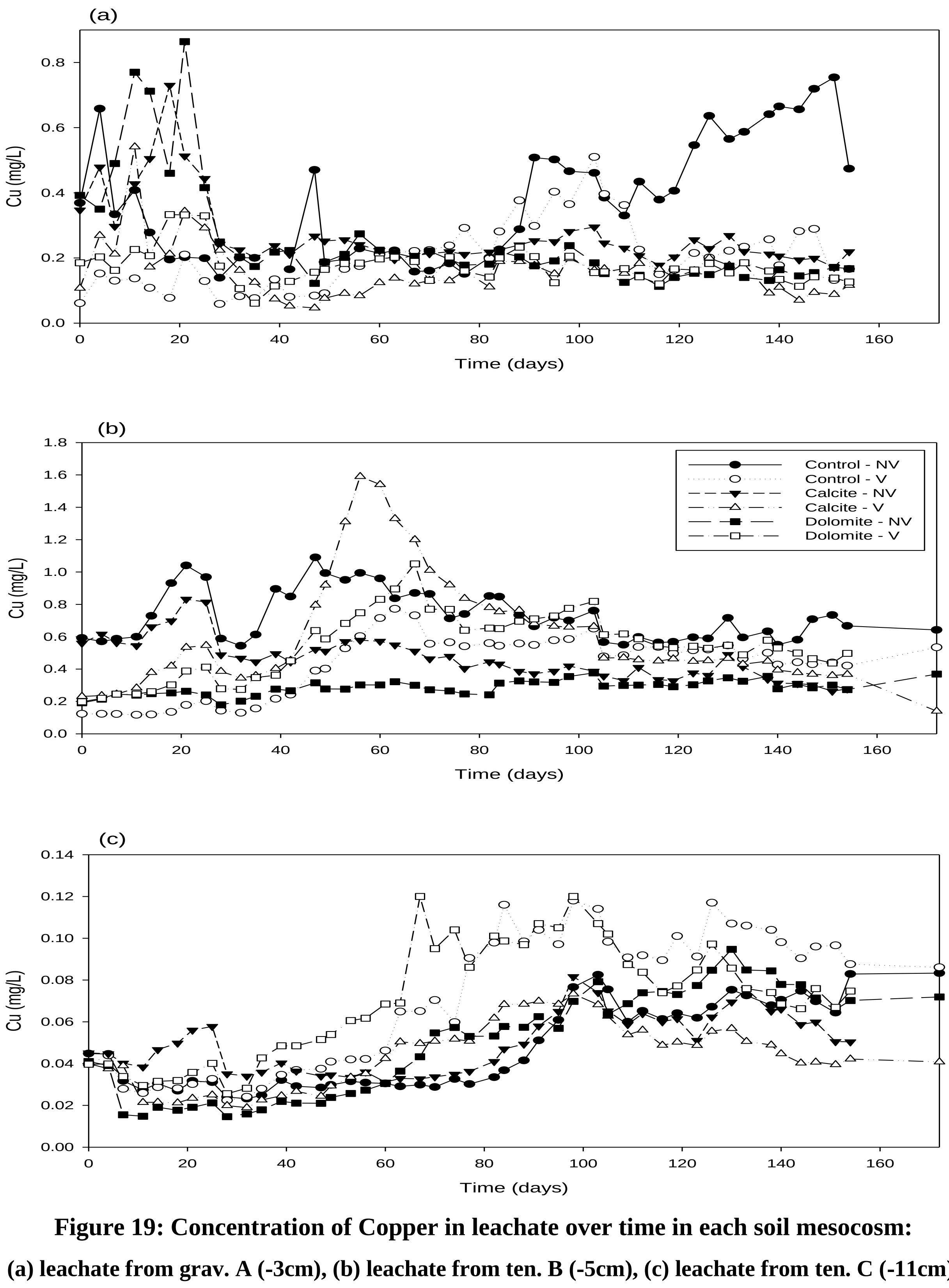

Figure 19: Concentration of Copper in leachate over time in each soil mesocosm:
(a) leachate from grav. A (-3cm), (b) leachate from ten. B (-5cm), (c) leachate from ten. C (-11cm).

The mean Ni and Cu concentration in the leachate samples indicates the extent of migration down the soil profile of metals, as well as the release and retention regions of the pedon. Figure 20 shows the mean leachate concentrations for both Ni and Cu for all soil mesocosms. The concentration of Ni and Cu leached out of the bottom of the LFH and Ae horizons is reduced by both liming and vegetation establishment (Figure 20). Both metals show an increase from grav. A (LFH-Ae horizon interface) to ten. B (Ae-Bf horizon interface) reflective of the sample types, with A being gravitational or macropore water, and B being adsorbed or micropore water (Figure 20). A slight reduction in the concentration of Ni leached from the Bf to the BC horizon can be seen for dolomitic limestone amended columns (Figure 20). The concentration of Ni moving in solution through the mineral soil horizons is fairly consistent, with little Ni being retarded in any soil profile. In contrast, Cu potential mobility is greatly reduced for all soil mesocosms from the top Ae mineral horizon to the Bf mineral horizon (Figure 20).

Total concentrations of Ni and Cu in the soil matrix are unchanged after the mesocosm leaching experiment (not shown). However, the bioavailable concentrations of Ni and Cu are affected by the liming process (Figure 21). Liming greatly decreases the concentration of bioavailable Ni in the LFH horizon compared to the unlimed soil (Figure 21). Liming also decreases the concentration of bioavailable Cu in the LFH horizon, with the calcitic material having more effect than the dolomitic material (Figure 21). The bioavailable concentration of Ni and Cu in the top section of the LFH is variable between the unlimed soil with and without vegetation. The bioavailable concentration of Cu and Ni in the bottom 2 cm segment of the LFH horizon is very similar between these two samples (Figure 21).

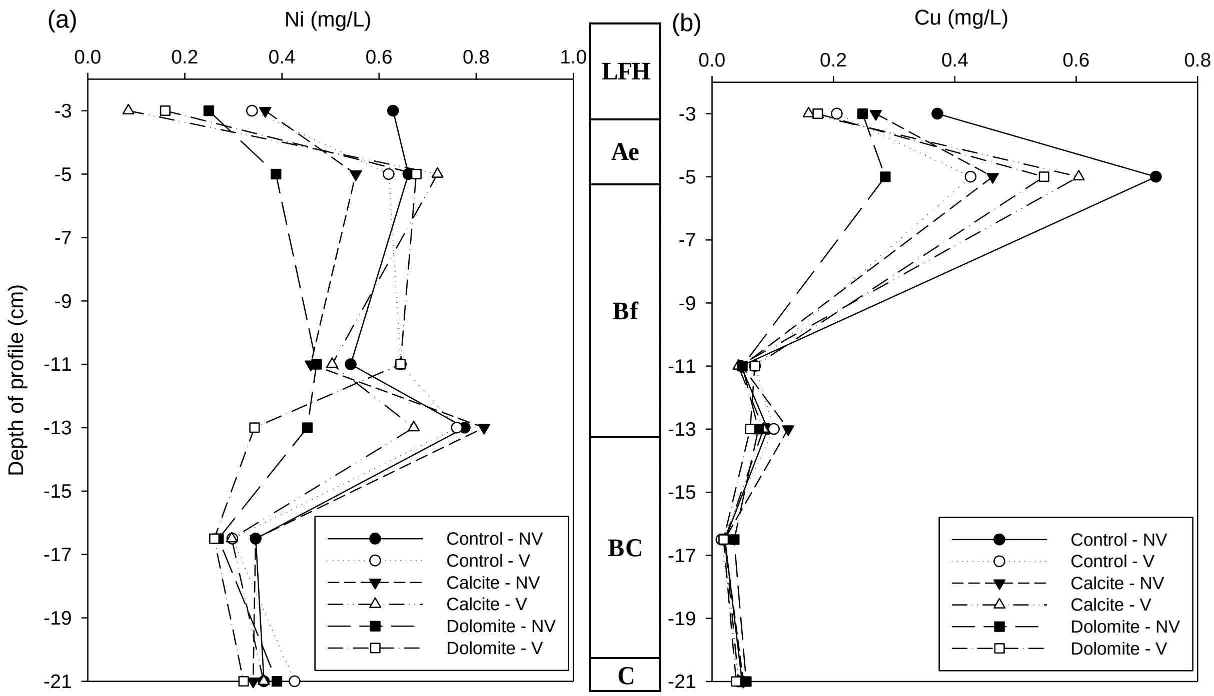

Figure 20: Mean leachate concentration of Ni (a) and Cu (b) for all soil mesocosms.

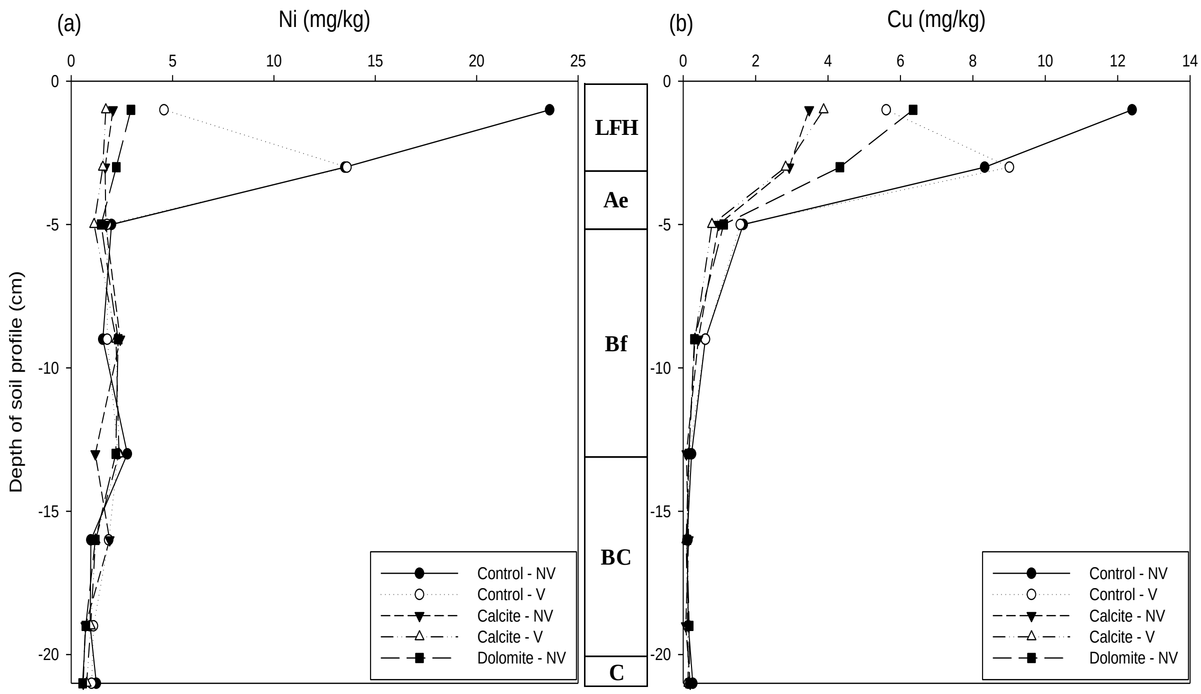

Figure 21: Concentration of bioavailable nickel (a) and copper (b) in the solid samples after mesocosm leaching.

3.4.1.2 Other chemicals of concern, iron and aluminum

Although Ni and Cu are of primary concern because of their high concentration of total and bioavailable species in the soil, other chemicals of concern were also investigated.

Selenium was found to exhibit no change in concentration in the leachates in the limed or unlimed soil columns, with no change in bioavailable metal concentration after leaching (appendix Table 13 and Table 15).

Cadmium and Co behaved in a manner very similar to Ni and Cu during the mesocosm experiment. The mean concentration and patterning for Cd in leachate solutions from all soil mesocosms looks very similar to that of Ni (Figure 22a). The potential mobility of Co increased with depth until the BC to C horizon, where the potential mobility remained fairly constant (Figure 22b). There is a slight reduction in the potential mobility of Cd and Co in grav. D (Bf-BC horizon interface) for both dolomitic limestone amended columns (Figure 22). The bioavailable concentrations of Cd and Co after the leaching experiment are affected in a very similar way to Ni, with liming greatly decreasing the bioavailability of both metals (Figure 23).

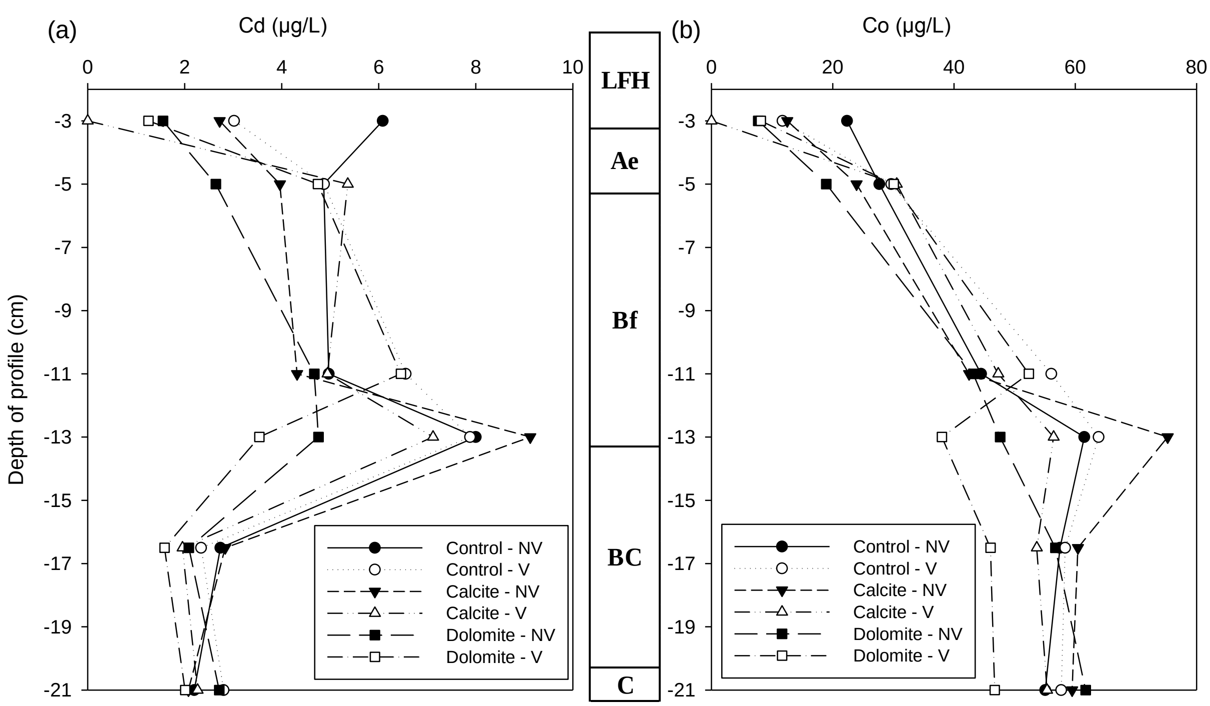

Figure 22: Mean leachate concentration for Cd (a) and Co (b) for all soil mesocosms.

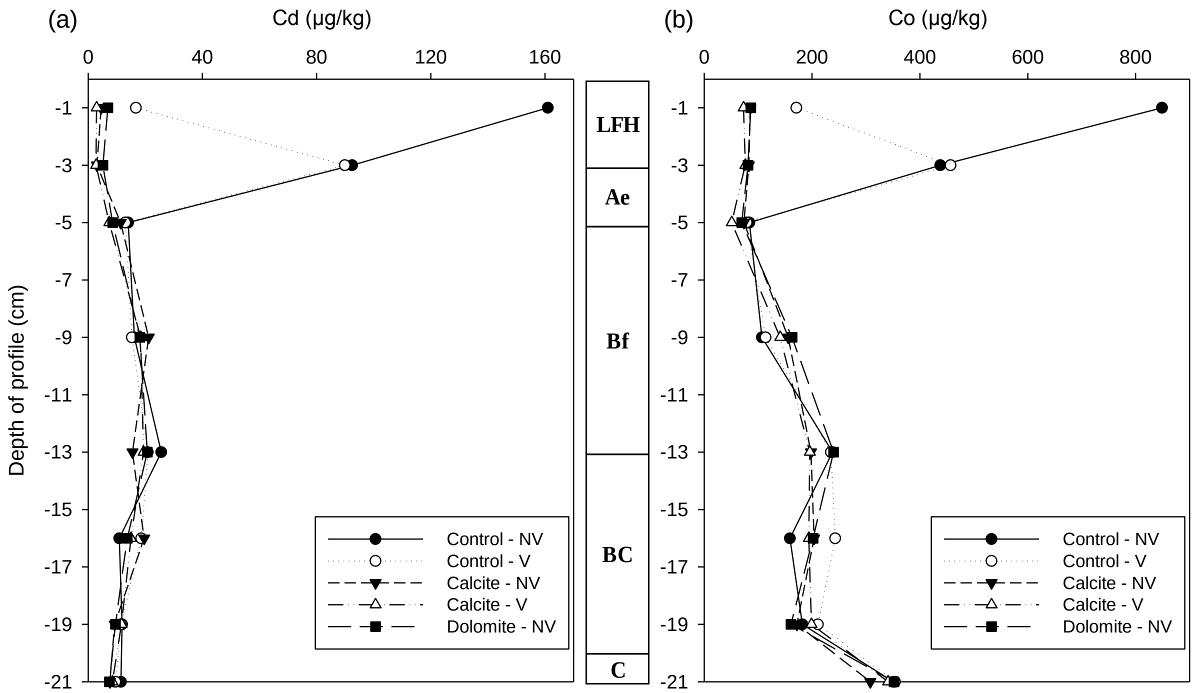

Figure 23: Concentration of bioavailable Cd (a) and Co (b) in the solid samples after mesocosm leaching.

The concentration of As in the leachate during the mesocosm experiment is not affected by liming, but is affected by planting the tickle grass. There is a much higher concentration of As leached from the LFH horizon for non-vegetated columns compared to those with vegetation (Figure 24a). The As concentration in the leachate is low and consistent throughout all mesocosm types in the lower mineral horizons of the soil (Bf-C) (Figure 24a). However, this establishment of vegetation does not impact the bioavailable concentration of As in the soil matrix after leaching. Figure 24 shows that liming does reduce the bioavailability of As in the LFH horizon, and that there is very little bioavailable As in the mineral soil horizons.

Aluminum does not show any change in the leachate concentrations during the dissolution experiment or the addition of vegetation to the mesocosms (Appendix Table 13), but there is a slight decrease in the bioavailability of Al in the upper LFH horizon with the addition of calcitic limestone when compared to the control columns (Figure 25). Unlike for other elements, only the Al in the surface of the LFH horizon seems to be affected by liming (Figure 25).

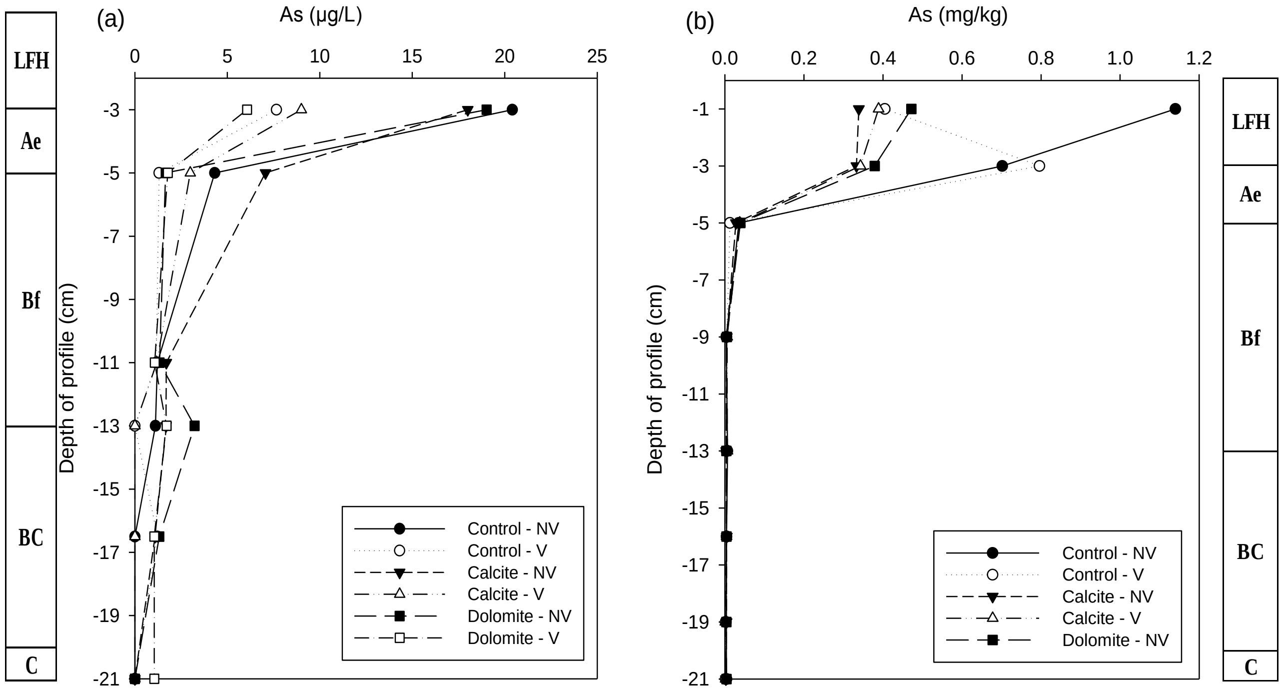

Figure 24: Arsenic value of (a) mean leachate concentration of all soil mesocosms, and (b) bioavailable concentration of the soil matrix after leaching.

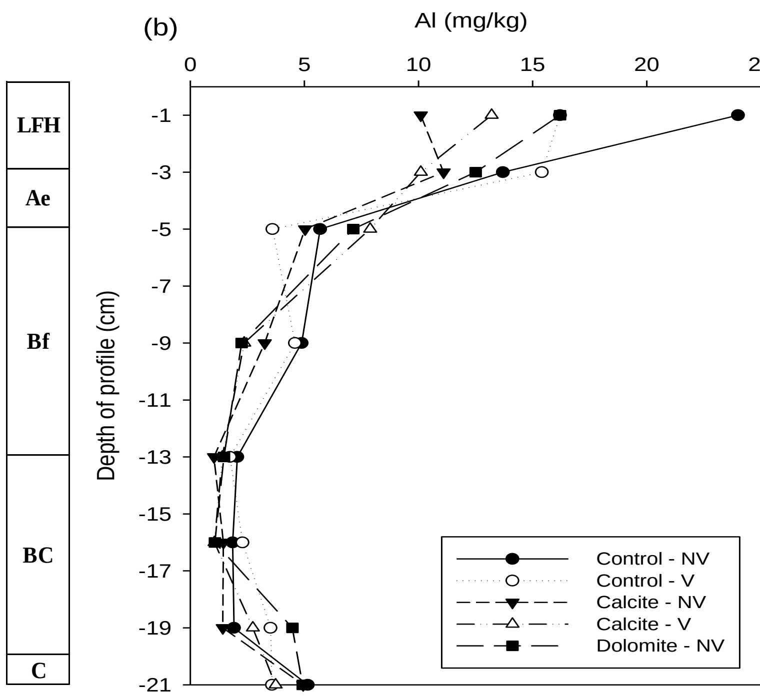

Figure 25: Bioavailable concentration of Al after leaching experiment.

Iron and Pb are unique in the fact that liming and the addition of vegetation has little to no effect on the concentration of these metals in the leachate. However, the bioavailable concentration of these elements is actually increased with the addition of dolomitic limestone (Figure 26). This increase is only observed in the upper segment of the LFH horizon of the soil, with very little Fe and Pb available in the lower soil horizons (Figure 26).

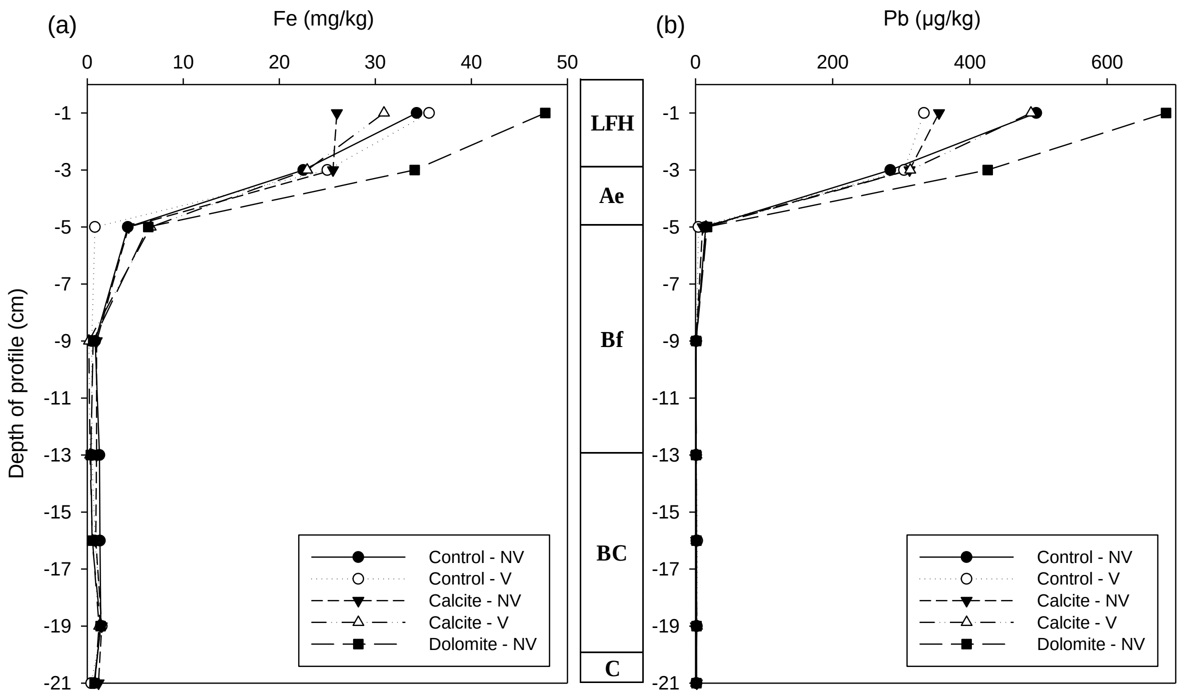

Figure 26: Bioavailable concentration of Fe (a) and Pb (b) after leaching experiment.

3.4.2 Discussion

Limestone was originally added to the Sudbury soils not only to increase pH and Ca and Mg concentrations, but also to detoxify the soils contaminated with the chemicals of concern (Winterhalder, 1995; Wren, et al., 2012). The chemicals of concern, along with Al and Fe, are discussed in three separate categories based on their observable changes in solution concentrations after liming and/or vegetation development: (1) Ni and Cu, (2) Cd, Co, As and Al, and (3) Fe and Pb.

3.4.2.1 Nickel and Copper

Nickel and Cu are of primary concern for Sudbury soils because they are often found in the highest quantities (Winterhalder, 1995; Wren, 2012; Wren, et al., 2012).The site selected to obtain the soil for this study is no exception, with total Ni and Cu concentrations of over 2800 mg/kg and 1100 mg/kg dry weight respectively, with associated bioavailable concentrations of 30 mg/kg and 38 mg/kg dry weight respectively (Table 3, Table 4). The addition of limestone causes a reduction in the concentration of Ni and Cu in percolating solution compared to that observed in the unvegetated control column. The addition of vegetation also causes a reduction in the concentration of Ni and Cu in the soil solution in grav. A compared to the unvegetated column. Therefore, the leachate data suggest that vegetation growth, even if small, can cause a reduction in Ni and Cu in solution similar to the addition of limestone in the top 5cm of soil (Figure 20). These results are surprising as liming is known to decrease the availability of Ni and Cu in the soil. Most studies which demonstrate this trend, however, only measure soil matrix material and do not analyze percolating solution data (Winterhalder, 1996; Wren, 2012). A study by Derome & Saarsalmi (1999) found that liming clearly decreased the concentration of both Ni and Cu in solution, but this experiment was performed over several years, with the reduction only being documented from year 1 to year 2 (no data from within year 1 were presented). Reductions in Ni and Cu in the leachate due to liming may only become apparent after more time has passed. A clear relationship between leachate pH and Ni concentration is observed for grav. A, with columns with the highest mean pH values having the lowest concentration of Ni in solution, a relationship also observed less strongly for Cu (Figure 14; Figure 20).

Similarly to Ca and Mg, there is an increase in Ni in the leachate sampled from ten. B and C samples around day 40, an increase observed for all columns except the unvegetated control column. The increase in Ca and Mg concentrations is most pronounced in the vegetated calcitic limestone amended column (Figure 18). Copper concentrations in the leachate are more variable, and an increase in ten. B at around day 40 was only observed for columns which had been limed and seeded (Figure 19). The addition of large amounts of limestone can cause a short term increase in the dissolution of heavy metals and soil acidity (Nohrstedt, 1992). The most likely mechanism inducing this dissolution is the increased amounts of Mg and/or Ca in solution released during limestone dissolution exchanging with the Ni^{2+}, Cu^{2+}, H^{+}, and Al^{3+} which are present on the soil exchange complex (Warfvinge & Sverdrup, 1988). Soil solutions from ten. B and C are sampled after the rainwater and dissolved limestone has had 24 hours to react with the exchange complex, demonstrating why the increase is not always observed for grav. A. This dissolution of Ni and Cu from the organic layer is enhanced by the growth of vegetation and the addition of limestone, with Ni solution concentrations being more affected than Cu. This phenomenon has been previously documented in soil solutions in the Sudbury area after liming (Skraba, 1989). Water quality measurements of local Sudbury lakes may also give insight into this dissolution behaviour in the field. Clearwater Lake, located 11km from the Copper Cliff smelter, showed a sharp increase in soluble Ni from 1977 to 1980 and again from 1981-1983 (Gunn, et al., 1995). Initially, the concentration of Ni and Cu in the lake waters began to decline from 1972-1977, most likely associated with reductions in emissions, with the Cu in lake water continuing to decrease from 1972 onwards (Gunn, et al., 1995). The liming of the soil surrounding the lake possibly took place in 1977 and again in 1982, leading to an increase in lake water pH and Ni concentrations (Gunn, et al., 1995), a hypothesis requiring more supportive investigation. Another study by Gunn, et al. (2001) observed a brief pulse in metal concentrations immediately after wetland liming treatments, which persisted for a few weeks. The most likely cause of this increase was the displacement of metal cations at the soil exchange sites by the addition of Ca from limestone (Gunn, et al., 2001).

Although the soil solution can display variable results for concentrations of dissolved species, the soil matrix data collected after the leachate experiment was completed show trends similar to those described for other studies of limed acid, metal-contaminated soils from the Sudbury region (Lautenbach, et al., 1995; Winterhalder, 1996; Abedin, et al., 2012; Nkongolo, et al., 2013). The addition of limestone has no effect on the total concentration of Ni or Cu in the soil but does cause a large decrease in the bioavailable concentration of the metals (Figure 21). Calcitic limestone amendments cause a larger reduction in the bioavailable concentration of both Ni and Cu, when compared to dolomitic limestone columns, related probably to a greater increase in pH (Figure 16a). The neutralizing and detoxifying effects of the limestone are apparent only in the top 3-5cm of the soil profile. Liming does not cause a reduction or increase in Ni and Cu in the soil solution or soil matrix beyond the surface zone of accumulation.

Much work has been done on the mineralogical forms of Ni and Cu in the top zone of accumulation in contaminated Sudbury soils in an effort to understand the mobility of these metals (Adamo, et al., 1996; Langteigne, et al., 2012). These studies showed that Cu has a greater potential mobility in the Sudbury soils when compared to Ni; Cu was found to be closely associated with organic matter, clays, and smelter-derived particles whereas Ni was found to be closely associated with only the smelter-derived particles (Adamo, et al., 1996). This was an unexpected result as Cu is usually less mobile than Ni in the soil, forming stronger complexes with organic materials, Fe oxides, and clay minerals, leading to a reduction in mobility (Baker, 1990; Young, 2013). The ratio of Cu and Ni emitted from Sudbury smelter processes are close to 1 (Wren, 2012), with Cu being preferentially released by smelter-derived particles, leading to increased mobility in soils (Langteigne, et al., 2012). The soil used for this study contains more than double the concentration of Ni than Cu in the LFH horizon, suggesting that more potentially mobile Cu may have already been leached from the acid soil layer (pH 3.7).

When the concentration of Cu and Ni in solution in the upper 5cm of the soil is normalized to the total concentration in the LFH horizon, it is apparent that relative solubility of Cu in solution is greater than Ni for all soil mesocosms, an observation expected from previous studies on Ni and Cu mobility (Adamo, et al., 1996; Langteigne, et al., 2012). However, the solution data also demonstrate that the increase in Cu potential mobility relative to Ni is controlled by the mineralogy of the smelter-derived particles, which only impacts the surface 5cm of the soil (known as the zone of accumulation). The potential mobility of Ni is ten times higher than Cu in the lower mineral horizons (Bf, BC, and C) (Figure 21). Once Cu and Ni ions which have been released from the smelter-derived particles migrate downwards to the mineral soil horizons, their potential mobility is no longer affected by the nature of the smelter-derived particles, but rather by their interactions with soil.

3.4.2.2 Cadmium, Cobalt, Aluminum, and Arsenic

Liming decreased the bioavailable concentrations of Cd, Co, Al and As in the LFH horizon (top 3cm Cd, Co, As, top 1cm Al), with no effect on the total concentration of these elements. These results are in agreement with current studies on the bioavailability of metals in limed Sudbury soils (Nkongolo, et al., 2013). The solution data are more variable, where Cd and Co follow similar patterns to Ni and Cu and do not show a large impact from liming.

The bioavailable concentration of Al in the bulk of the LFH horizon (1-3cm) was only slightly reduced by liming. The availability of Al is affected greatly by the pH of the soil and, as liming did not increase the pH of the LFH horizon (at 1-3cm) above 5, the Al present remained bound to organic matter and not precipitated as $Al(OH)_3$ as it would at higher pH (Walker, et al., 1990).

Other metals such as Cd and Co appear to be less affected by this decrease in pH from 0-1cm to 1-3cm, as their bioavailable concentrations remained low throughout the organic horizon following liming additions. The reduction in bioavailable Cd and Co is caused by increased adsorption onto exposed oxy-acid groups on humus and due to the formation of inner-sphere complexes with hydrous oxides; these processes are driven by an increase in soil pH (eq. 9) (Young, 2013). A direct precipitation of these metals with hydroxide and bicarbonate ions released during limestone dissolution is also possible (eq. 11) (Derome, 2000).

The As concentrations in the leachate in grav. A, which is directly under the LFH horizon, exhibit no effect from surface lime applications. However, the seeding of tickle grass decreased the concentration of As in solution for control, calcitic, and dolomitic limestone columns. This may be due to grass roots taking up As from solution because of chemical similarities to P in solution, thus reducing the concentration of As in the leachate (Tu & Ma, 2004). Under the measured E_H and pH conditions, the As present in the soil is likely arsenate. Since arsenate and phosphate are chemical analogues, plants can take up arsenate (Tu & Ma, 2004).

3.4.2.3 Iron and lead

Liming does not change the soil leachate or soil matrix total concentration of Fe and Pb, but does generate some interesting trends in the bioavailable concentrations of the metals. Dolomitic limestone increased the bioavailable concentration of Fe and Pb in the LFH horizon from a mean of approximately 28 mg/kg and 360 μg/kg to 42 mg/kg and 550 μg/kg respectively. Calcitic limestone did not cause a similar increase in bioavailable concentrations of Fe or Pb. These results are in contrast to other limed soil studies which have found that limestone decreases the bioavailability of Fe (Nkongolo, et al., 2013) and Pb (Levonmaki & Hartikainen, 2007). The increased bioavailable concentration of Pb is easily explained by the contribution of Pb present in the dolomitic limestone (217 mg/kg). The dissolution of limestone study suggested that only negligible amounts of Pb were being released from dolomitic limestone, but the bioavailable extraction was able to remove more Pb, reflective of increased potential mobility. For future re-greening projects, assuring that the limestone does not contain high amounts of Pb will minimize this problem. Both dolomitic and calcitic limestones have similar concentrations of total Fe (<0.3%) and similar concentrations of Fe leached during the dissolution experiment. More detailed analysis of the limestones would reveal if the Fe present is more mobile in the dolomitic limestone, which could explain the increase in bioavailable Fe. This increase in bioavailable Fe could have reacted with hydroxides released during dolomitic limestone dissolution and precipitated as $Fe(OH)_3$ (eq. 10), contributing to the lower increase in pH for dolomitic limestone compared to calcitic limestone in the soil leachate data.

3.4.2.4 Summary

The addition of limestone, both calcitic and dolomitic, has no affect on the total concentration of chemicals of concern but does decrease the bioavailability of Ni, Cu, Co, Cd, As and, to some extent, Al in the LFH horizon. Leachate data suggests a short term increase in Ni and Cu in the pore water solution in ten. B and C samples may be caused by liming, and exaggerated by seeding of tickle grass. Planted vegetation also decreases the potential mobility of As in the soil solution below the LFH horizon. Liming with dolomitic materials actually increases the concentration of bioavailable Fe and Pb in the LFH horizon.

3.5 Movement of nutrients and non-metals through soil mesocosm

Although focus is usually placed on the mobility of contaminant metals, the mobility of nutrients and non-metals in contaminated soils cannot be ignored as they are of importance for the stability of the forest ecosystem. The movement of nutrients and non-metals through the soil mesocosms during leaching, and also the change in these parameters in the soil matrix material after the leaching experiment was completed, will be presented and discussed in this section.

3.5.1 Results

3.5.1.1 Nutrient metals

Boron, Na, and K were found to exhibit no change in soil solution concentration in either limed or unlimed soils during the experiment, with no observable change in bioavailable metal concentration after leaching. Only P showed a change in the concentration in the soil solution during the leaching experiment, with no effect from liming on the bioavailable concentration of

P being observed. Figure 27 shows that the concentration of P in the leachate is reduced by liming and also by the addition of vegetation to an unlimed column. The dolomite amended columns and unvegetated control column showed the greatest reduction in P in the leachate.

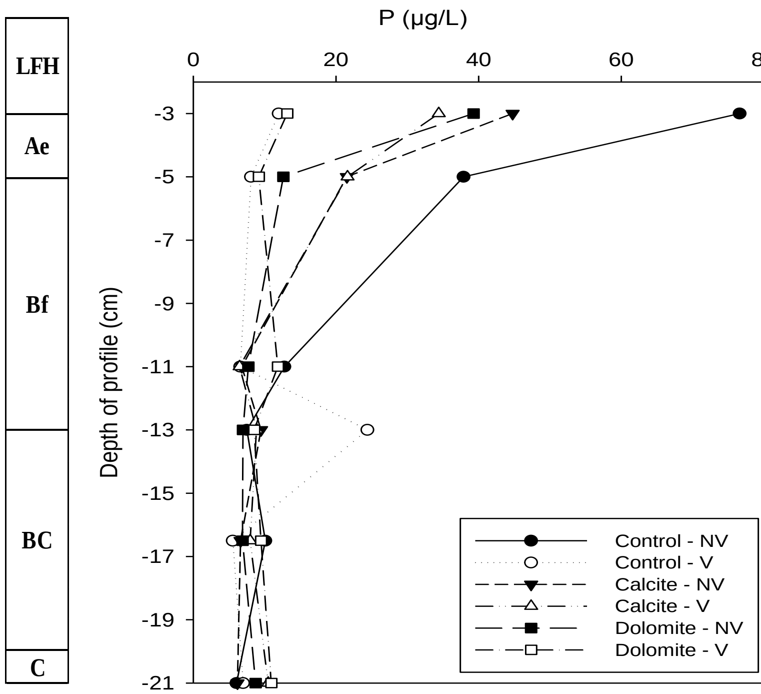

Figure 27: Mean leachate concentration of P in all soil mesocosms.

Other nutrients metals (Ba, Mn, Sr, and Zn) demonstrated little to no solution concentration effect from liming or the addition of vegetation, but do show a change in their bioavailable concentration of the soil matrix with the addition of limestone. The bioavailable concentrations of Ba, Mn, and Zn in the soil matrix after leaching have a very similar pattern to other metals (Cd, Co, Cu, and Ni), where the bioavailable concentration is reduced in the upper segment of the LFH horizon due to liming (Figure 28). Barium has slightly higher bioavailable concentrations with calcitic as compared with dolomitic amendments to the columns, whereas Zn displays the opposite (Figure 28). The bioavailability of Ba actually increases in the mineral soil horizons (Bf-C) compared to the organic and eluviated horizons (LFH and Ae). No other metals show this trend (Figure 28). The addition of limestone increases the concentration of bioavailable Sr (from approximately 0.7 mg/kg to approximately 1 mg/kg in control and limed mesocosms respectively), but there is no change in the leachate concentrations of Sr due to liming.

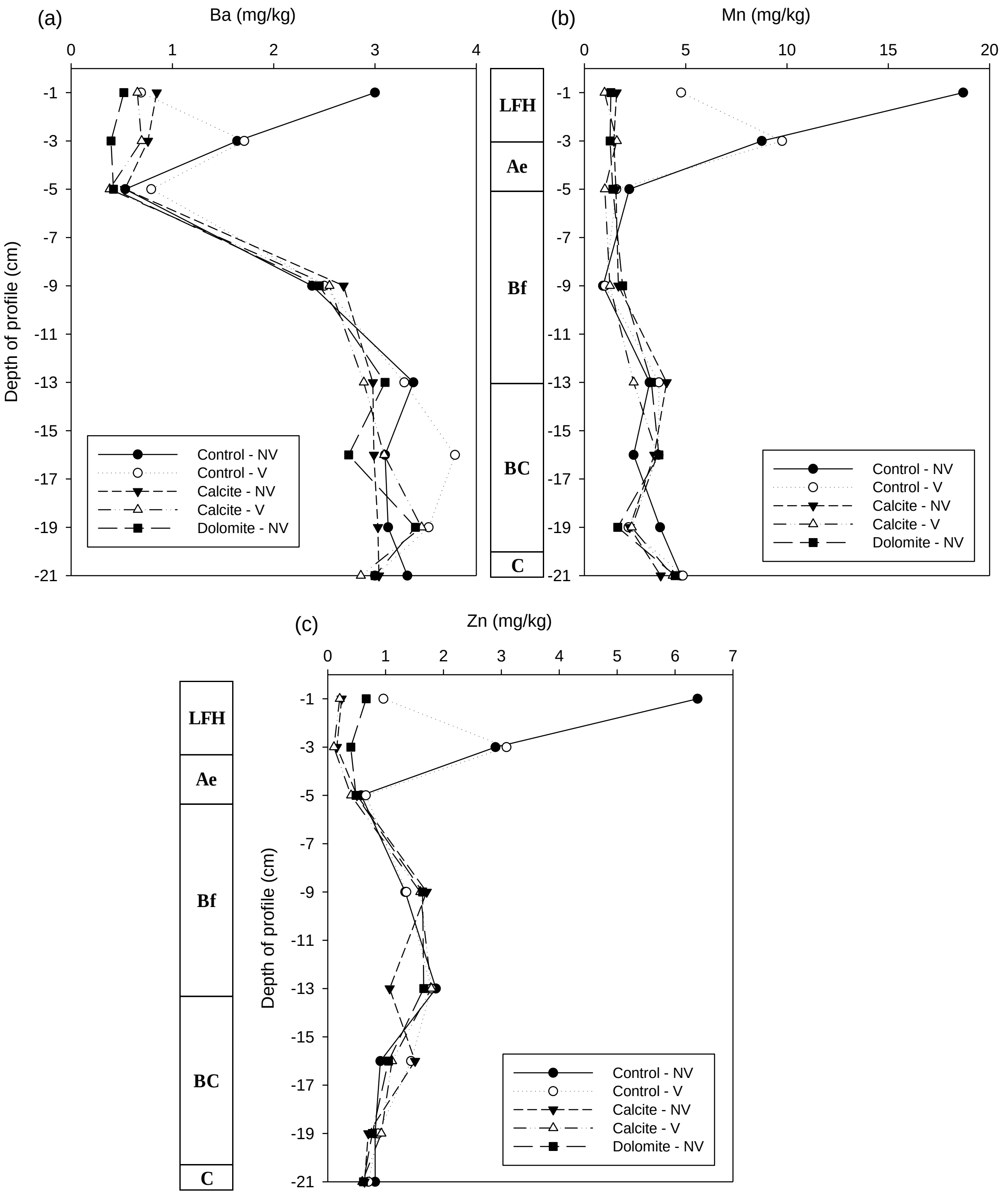

Figure 28: Bioavailable concentration of Ba (a), Mn (b), and Zn (c) after leaching experiment.

3.5.1.2 Non-metals

The addition of limestone had little effect on the movement of non-metal nutrients through the vertical soil mesocosms. Nitrogen ion concentration showed no change in the leachate concentration due to liming or vegetation establishment. The total C, N, and S concentration of the soil matrix material was also not affected by either liming or vegetation development. As the concentration of DOC in the leachate was variable, a cumulative total DOC leached was calculated and compared to the surface area of each sampling location (gravitational and tension lysimeters had different surface areas). The cumulative DOC leached illustrated some interesting trends (Figure 29). Samples from grav. A (directly under the LFH horizon) has the highest amount of DOC in the leachate, and liming appears to increase the concentration of DOC in solution (Figure 29). This increase in DOC concentrations due to liming is only present in samples from grav. A. Samples from grav. D have more translocated DOC compared to ten. C for most columns, indicating transport of DOC in solution through the top Bf horizon in the free flowing sample solution, and is not retained in the micropore soil solution (Figure 29). Any DOC which travels through the Bf horizon must then coagulate and precipitate in the BC or C horizon since there is a reduction in the amount of DOC leached from Port F (Figure 29).

The concentration of SO_4^{2-} in solution was affected by the addition of limestone to the soil surface. Both calcitic and dolomitic limestone amendments induced slightly increased concentrations of SO_4^{2-} in solution in the upper 5cm of soil (Figure 30). Other non-metal anions (F^-, NO_2^-, Br^-, PO_4^{3-}) were investigated, but their concentrations were too low to be detected by the method of determination. Chloride potential mobility was also investigated but, as with NO_3^-, the solution concentration was not affected by either liming or vegetation establishment on the columns.

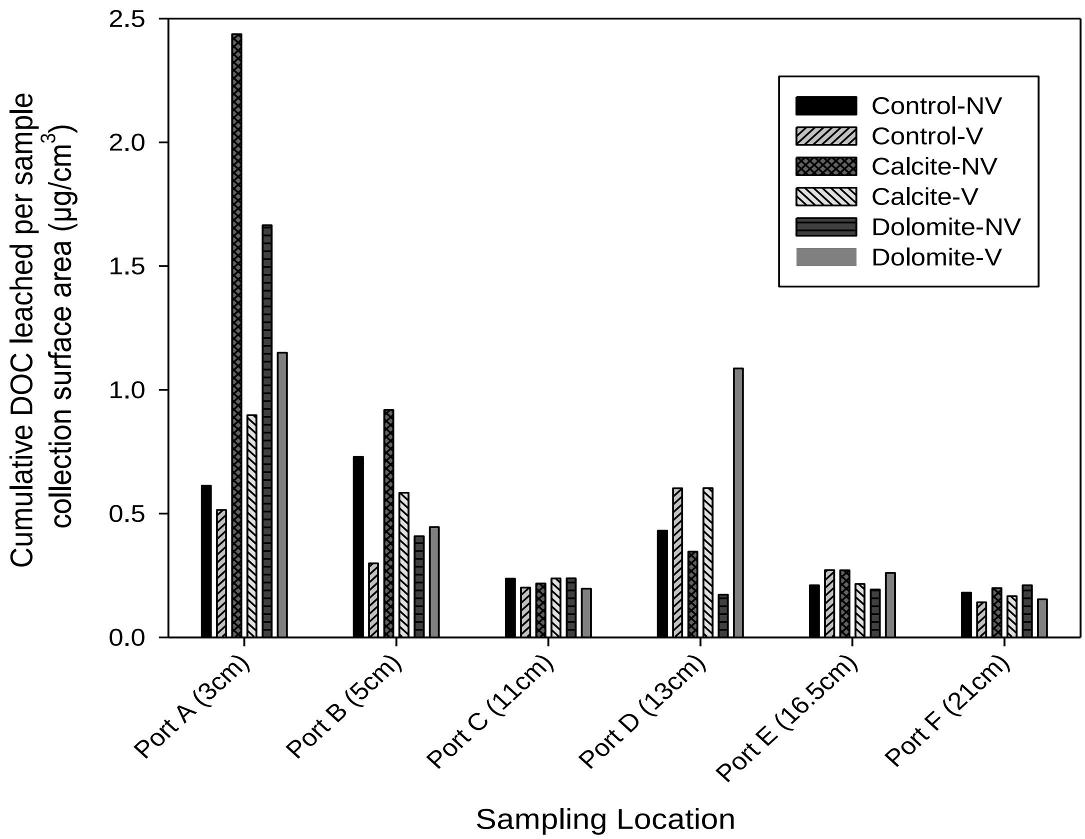

Figure 29: Cumulative amount of DOC in leachate samples:

Results corrected for surface area of sampling Port. Sampling ports A, D, and F are gravitational lysimeters and B.C, and E are tension lysimeters.

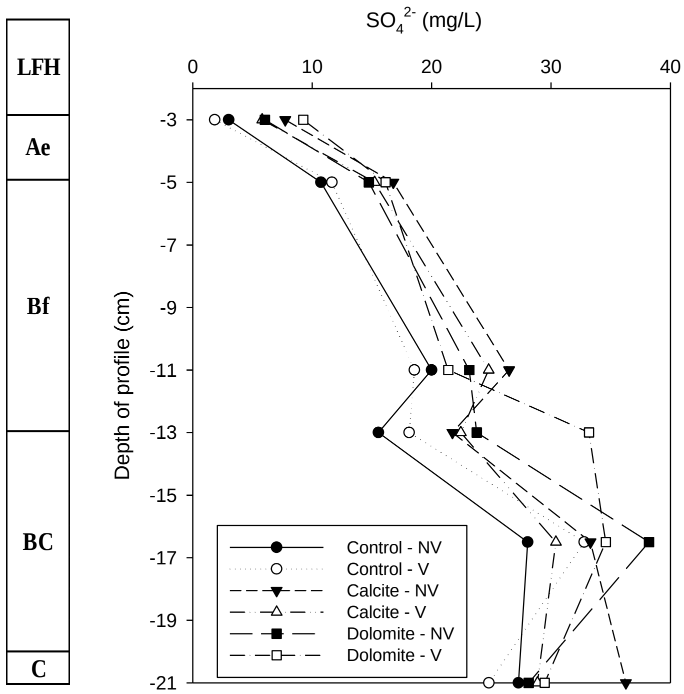

Figure 30: Mean Leachate concentration of sulphate for all soil mesocosms.

3.5.2 Discussion

The goal of the re-greening process in Sudbury was, and still is, to reclaim the contaminated soil to provide support for a stable, functioning vegetative community (Winterhalder, 1995). Nutrient metals and non-metals play a very important role in the forest ecosystem, and their behaviour in soils and soil solutions are therefore of interest in the context of developing and maintaining a stable, functioning ecosystem. Only nutrient metals and non metals which displayed observable changes in soil leachate and/or soil matrix concentration after mesocosm experiment are discussed further. Other nutrients which are required for plant growth (K, Na, N, Cl) were not affected by liming or vegetation.

3.5.2.1 Nutrients metals

Before Sudbury re-vegetation efforts began, many of the sandy soils around Sudbury were found to be deficient in P, most likely due to loss of soil organic matter and excessive nutrient leaching and/or surface erosion (Winterhalder, 1995). Phosphorus deficiencies have the potential to become a limiting factor for vegetation growth in Sudbury soils once metal toxicities have been reduced (Winterhalder, 1995). Studies have shown that liming acid soils can cause an increase in available P by enhancing mobility (Kamprath, 2000; Holford, et al., 1994; Derome & Saarsalmi, 1999). The present study showed no change in bioavailable P after liming, but does demonstrate a decrease in leachate P concentration in the top 5cm after surface liming and vegetation establishment. This reduction was as great as 50 to 75 %, an obvious contrast to other studies. The bioavailable concentration of P may not have changed due to liming because this value was already quite high (>5 % of total P) before the leaching experiment began. Soil studies which showed that lime increased P availability to plants also involved the addition of fertilizers (Lautenbach, et al., 1995; Winterhalder, 1996; Holford, et al., 1994). The addition of lime may not increase the availability of P already present in the soil, but may increase the availability of P added by commercial (NPK) fertilizers. For soils deficient in P, it is obvious that P fertilizers are required to increase its availability. If there is P already present in the soil, the addition of limestone may not be sufficient to increase the availability of P already present.

Barium and Sr, as with Ca and Mg, are alkaline earth metals and therefore are expected to behave similarly in limed soils. Liming increases the bioavailable concentration of Mg and/or Ca in the soils because limestone dissolution releases these product ions into the soil solution. Liming with either calcitic or dolomitic materials increases the bioavailable concentration of Sr in the LFH horizon, most likely because Sr is being added to the soil solution by limestone dissolution. Limestone does not add any available Ba to the soil and the bioavailable concentration of Ba in the LFH horizon is actually decreased by the addition of limestone.

Manganese and Zn are important micronutrients required for plant growth (Kamprath, 2000). Liming decreases the availability of these micronutrients by increasing the pH (Kamprath, 2000). Manganese and Zn deficiencies can become a major problem requiring fertilizer applications of Mn and Zn along with lime to some acidic agricultural soils (Kowalenko & Ihnat, 2013). Nickel contaminated soil in Port Colborne, Ontario, required a Mn application along with lime to reduce Mn deficiencies (Kukier & Chaney, 2000). Manganese deficiencies can also be induced if too much Ca is added to the soil (Bekker, et al., 1994). The addition of either calcitic or dolomitic limestones greatly decreases the availability of Mn and Zn in the LFH horizon of the present study. Although the bioavailable concentrations of Mn and Zn are low due to liming, the pH of the LFH horizon did not increase beyond pH 6. Below pH 6.5 for Mn and pH 7.7 for Zn, much of the element remains in available forms, primarily as complexes with organic matter

(Kamprath, 2000). Therefore, Mn and Zn deficiencies may not be an issue for current un-eroded and limed Sudbury soils, but further investigation may be beneficial especially in areas which show poor plant growth.

3.5.2.2 Non-metals

Dissolved organic carbon (DOC) concentrations in the leachate were highest in gravitational lysimeters installed directly below the LFH horizon (grav. A) but were also high in tension lysimeters under the Ae horizon (ten. B) and gravitational lysimeters under the Bf horizon (grav. D). These observations suggest that the DOC migrating through the mineral soil horizons is mostly found in the gravitational macropore water, and is not held by electrostatic tension to soil matrix particles in the micropore water. The low concentration of DOC leached from the bottom of the soil column suggests that, although some DOC may travel through the Bf mineral horizon, most is then immobilized in the BC and/or C horizon. Liming and/or vegetation do not appear to affect the concentration of DOC in the leachate beyond the LFH horizon (grav. A). Liming increased the concentration of DOC leached from the LFH compared to the control columns, and the unvegetated columns had higher concentrations of DOC in the leachate when compared to the same vegetated treatment. Other studies have also found that liming increases DOC leaching (Andersson & Nilsson, 2001; Levonmaki & Hartikainen, 2007; Ahmad, et al., 2013). This increase in DOC with liming can be attributed to an induced increase biological activity (Biasi, et al., 2008) , with the neoformation of low molecular weight organic compounds that are prone to leaching (Andersson, et al., 1994).

The anions quantified in the solutions showed no change in soil solution concentration due to liming or vegetation with the exception of SO_4^{2-}. The addition of either calcitic or dolomitic limestones increased the concentration of SO_4^{2-} in the leachate through the soil profile from the LFH horizon to Bf horizon, yet the total concentration of S in the soil matrix material was unchanged. A study by Derome & Saarsalmi (1999) also demonstrated that SO_4^{2-} concentrations in soil solutions are increased due to liming. Sulphate present in the soil is adsorbed onto positively charged exchange sites such as the edges of clay minerals, organic matter, and Fe/Al oxides (Chao, et al., 1962). As pH increases, the exchange sites become more negatively charged, leading to desorption of SO_4^{2-} , which leads to an increase in SO_4^{2-} concentration in solution (Kamprath, 2000). The pH of the soil remained elevated due to liming into the Bf horizon, but not beyond into the BC mineral horizon, which is the probable cause for the increased SO_4^{2-} in the leachate. The increased downward movement of SO_4^{2-} could cause an increase in associated cation movement down the soil profile as neutral ion pairs, as the downward movement of cations in podzolic soil is limited by low concentrations of inorganic anions in the soil solution (Krug & Frink, 1983).

3.5.2.3 Summary

Liming has little effect on the potential mobility of many soil nutrients including K, Na, N, Cl, and B. Liming with either calcitic or dolomitic materials does, however, decrease the bioavailability of Ba, Mn, and Zn while increasing the bioavailability of Sr in the top organic layer of the soil. In the soil solution, liming induces decreases in concentration of P in the LFH horizon solutions, and increases the concentration of SO_4^{2-} in the LFH, Ae, and Bf soil horizons. The amount of dissolved organic carbon (DOC) in the soil solution directly under the LFH horizon was increased following liming with either calcitic or dolomitic materials compared to control columns. This increase is most likely due to an increase in microbial activity (Biasi, et al., 2008), with the formation of low molecular weight organic compounds which are prone to leaching (Andersson, et al., 1994).

Chapter 4

4 Conclusions

The dissolution rate of calcitic limestone used for this experiment was found to be approximately double that of the dolomitic limestone investigated. Both limestones had a similar particle size distribution pattern and followed the equal diameter reduction dissolution model (Elphrick, 1955). Using this model and the annual rainfall for Sudbury, Ontario, it will take approximately 36-40 years and 80-86 years to dissolve the calcitic and dolomitic limestone, respectively. The pH of the percolating rainwater was strongly influenced by the dissolution of limestone, increasing by one to over three pH units for both the calcitic and dolomitic limestone treatments.

Most of the impacts of liming were found in the top 3-5 cm of the soil column, which consists of the LFH horizon (0-3 cm) and the eluviated Ae horizon (3-5 cm). Most of the soil biological activity occurs in the top organic horizon which retains most of the nutrients required for plant growth.

Amending acid, contaminated soils with calcitic or dolomitic limestone has profound effects on soil solution chemistry. Liming with calcitic materials increases the concentration of Ca in solution down to the Bf horizon, but not beyond this depth. Similarly dolomitic material addition increases the concentration of Mg in solution down to the Bf horizon. The addition of dolomitic material did not increase the concentration of Ca in solution compared to the control, even through dolomite contained over 20 % Ca and high concentrations were found in the solutions in dissolution experiment. After the leaching experiment was completed, the total and bioavailable concentration of Ca in the LFH horizon was increased by both calcite and dolomite additions (more in calcite). Dolomite also increases the total and bioavailable concentration of Mg in the LFH horizon. Increased concentrations of Ca and Mg were not seen in the soil matrix materials beyond the top organic horizon. Liming with either calcite or dolomite increases the pH in the top 5 cm, and decreases the E_H in the top 3 cm of the soil column. All the residual limestone from both calcitic limestone and dolomitic limestone was found in the top organic horizon. Liming also increases vegetation growth in both seeded columns and unseeded columns compared to control columns.

The soil used for this study was highly contaminated with most of the chemicals of concern outlined by the Sudbury soil study (Wren, 2012). The addition of limestone, both calcitic and dolomitic, had no affect on the total concentration of chemicals of concern, but does decrease the bioavailability of Ni, Cu, Co, Cd, As and, to some extent, Al in the LFH horizon. A short term increase in Ni and Cu in the pore water solution in tension lysimeters B and C was observed in limed columns, with this increase being exaggerated by seeding of tickle grass. The most likely cause for this increase in leaching of Ni and Cu is the increase of Mg and/or Ca released during limestone dissolution exchanging the Ni and Cu ions present on the soil exchange complex. Planted vegetation decreases the potential mobility of As in the soil solution under the LFH horizon. Liming with dolomite actually increases the concentration of bioavailable Fe and Pb in the LFH horizon, which may have negative effects on the soil.

Liming has little effect on the potential mobility of many soil nutrients, including K, Na, N, Cl, and B. Liming with either calcitic or dolomitic limestone does, however, decrease the bioavailability of Ba, Mn, and Zn while increasing the bioavailability of Sr in the top organic later of the soil. In the soil solution, liming decreases concentration of P in the LFH horizon, yet increases the concentration of SO_4^{2-} in the solutions from LFH, Ae, and Bf soil horizons. The amount of dissolved organic carbon (DOC) in the soil solution collected directly under the LFH horizon increases due to liming with either calcitic or dolomitic limestone when compared to control columns. This increase is most likely due to increased microbial activity (Biasi, et al., 2008) and the formation of low molecular weight organic compounds which are prone to leaching as microbial decomposition products (Andersson, et al., 1994).

Chapter 5

5 Implications to mine reclamation and future work

Much of the re-greening of Sudbury success has been attributed to the use of dolomitic limestone as a reclamation amendment (Winterhalder, 1995). Adding dolomitic limestone not only increases the amount of bioavailable Mg when compared to calcitic limestone, but also has a much slower dissolution rate. This slower dissolution rate is beneficial for the Sudbury restoration efforts because it will continue to release Ca, Mg, and buffering products to the forest soil ecosystem for a longer period of time. This will allow for further, stable ecosystem development, thus improving the soil's ecosystem functioning potential no longer in need of outside reclamation efforts. It is recommended that future Sudbury re-greening programs continue to use dolomitic limestone. The present study also showed that Mn and Zn deficiencies may be present in newly limed soils. An assessment of micronutrient availability and possible deficiencies to plants could be beneficial for Sudbury's limed soils. A parallel study using eroded soil without a developed organic horizon (such as one found within the barren vegetation zone) would be useful to compare with the present study. A detailed field study of paired limed and unlimed plots in the Sudbury area would complement the present study and allow for the measurement of interactions between added limestone and acid metal contaminated soil over a longer time scale. This study alone cannot accurately assess if, or when, the positive effects of liming will be exhausted, and if this will lead to a regression of the plant communities. Additional research is needed to ensure that the world renowned re-greening efforts of Sudbury's forest ecosystems are everlasting.

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Appendix A: Tabulated data

Thesis numerical data are available at the end of this document for the following analyses:

Table 10: Iron and Aluminum concentrations of three extractions: pyrophosphate, dithionite, and acid oxalate.

Table 11: Elemental analysis of all limestone size fractions.

Table 12: Concentration of calcium and magnesium from small limestone columns.

Table 13: Soil mesocosm leachate experiment data for all metals, non-metals, pH, EC, E_H, and volumes collected.

Table 14: Total metal concentration of soil matrix material, separated by soil horizon and subhorizons, before and after leaching experiment.

Table 15: Bioavailable metal concentration of soil matrix material, separated by soil horizons and subhorizons, before and after leaching experiment.

Table 16: C, N, S and moisture content of soil matrix material before and after leaching experiment.

Table 17: pH, conductivity (EC) and oxidation/reduction potential (E_H) of soil matrix before and after soil mesocosm experiment.

Appendix B: Dissolved organic carbon quantification of soil water by ultraviolet spectroscopy

Abstract

The quantification of dissolved organic carbon (DOC) is an important parameter in many environmental studies. Organic matter, such as DOC found in soil pore water, lakes, rivers, and sediments, absorbs light over a wide range of wavelengths. The objective of this research was to evaluate the effectiveness of UV absorption as a faster, easier, and less expensive method for estimating DOC concentration in soil leachate samples, collected from soil macropores and micropores, at a range of soil depths, with high levels of metal contamination. Gravitational and tension lysimeter samples can be quantified using this method. The depth at which the sample is taken affects the relationship between the absorbance at 254 nm and the concentration of DOC. High concentrations of Fe, Cu, and Ti can lead to overestimations of DOC concentrations Other transition metals like Ni, Co, Cr, and Mn, and inorganic anions like NO_3^- do not cause increase in absorbance at 254 nm in the concentration ranges observed in this experiment.

Introduction

The quantification of dissolved organic carbon (DOC) is an important parameter in many environmental studies. DOC plays an important biogeochemical role within the soil profiles and in soil-stream systems (Fellman, et al., 2008). Measurements of DOC are typically preformed by high temperature catalytic oxidation methods (Spences, et al., 2007). These methods are time consuming and expensive when compared to UV spectroscopy methods. Large sample sizes are often required for environmental monitoring projects and measuring DOC by traditional methods may not be feasible. UV absorption has been investigated as a way to obtain quantitative and qualitative information on DOC in a variety of aqueous solutions (Amrhein, et al., 1992; Beauclerc & Gunn, 2001; Deflander & Gagne, 2001; Fellman, et al., 2008; Korshin, et al., 1997; Spences, et al., 2007; Traina, et al., 1990; Weishaar, et al., 2003; van den Broeke, et al., 2006).

Organic matter, such as DOC found in soil pore water, lakes, rivers, and sediments, absorbs light over a wide range of wavelengths. Chromophores present in DOC contain electrons which are promoted when the molecule absorbs light. The majority of chromophores that absorb light in the UV region (<400 nm) are aromatic groups present in a variety of DOC molecules like aromatic acids and phenols (Korshin, et al., 1997; Traina, et al., 1990; Weishaar, et al., 2003; Fellman, et al., 2008). UV spectra of DOC are usually found to be broad and featureless, decreasing in absorption from approximately 220nm to 400 nm (Wang, et al., 1990; Deflander & Gagne, 2001). Therefore, any number of wavelengths in this range can be used to estimate DOC concentration, but the lower the wavelength, the more sensitive the measurement. Using an absorbance measurement in this range to quantify DOC assumes that the DOC concentration is proportional to the UV absorbance. This is only true for samples with similar molecular compositions of DOC and samples which do not have interfering substances present (Deflander & Gagne, 2001).

Aromatic components of DOC are not the only molecules present in natural waters which absorb light in the UV region. Inorganic chemicals, like nitrates, absorb light at up to 230 nm and can therefore interfere with UV measurements close to this range (Korshin, et al., 1997; Weishaar, et al., 2003; Roig, et al., 2007; van den Broeke, et al., 2006). Transition metals also have the ability to form hydrated metal complexes which can absorb light in the visible spectrum and therefore can interfere with DOC measurements by absorption (Rayner-Canham & Overton, 2003). Concentrations of some transition metals can be high in soil waters, either from natural or anthropogenic sources. Soil pore water high in Fe (ferrous and/or ferric) can cause a larger absorption measurement which could lead to overestimations of DOC in solution (Weishaar, et al., 2003). Anthropogenic sources, like smelting and widespread deposition of metal-smelter particulates, can cause high concentrations of other transition metals like Cu, Ni, Co, and Cr in soil waters (Driscoll, 2013; section 3.4). Therefore, in highly metal contaminated soils, metals such as those mentioned may interfere with DOC absorbance measurements.

The objective of this research was to evaluate the effectiveness of UV absorption as a faster, easier, and less expensive method for estimating DOC concentration in soil leachate samples, collected from soil macropores and micropores, at a range of soil depths, with high levels of metal contamination.

Methodology

Soil collection and construction of mesocosms

The soil used for laboratory mesocosms was collected from inside the City of Greater Sudbury (Coordinates; N: 46°29'56.0", W: 80°58'20.2"). This location was chosen because the surface horizons of the soils are contaminated in the majority of chemicals of concern outlined by the Sudbury Soil Study (Spiers, et al., 2012; Driscoll, 2013; section 3.1.2). The pedon sampled was the Podzolic soil with the well-developed Ae horizon and deeper mineral Bf horizons (Figure 1). The pedon sampling and soil mesocosm construction is described in (Driscoll, 2013; section 2.2).

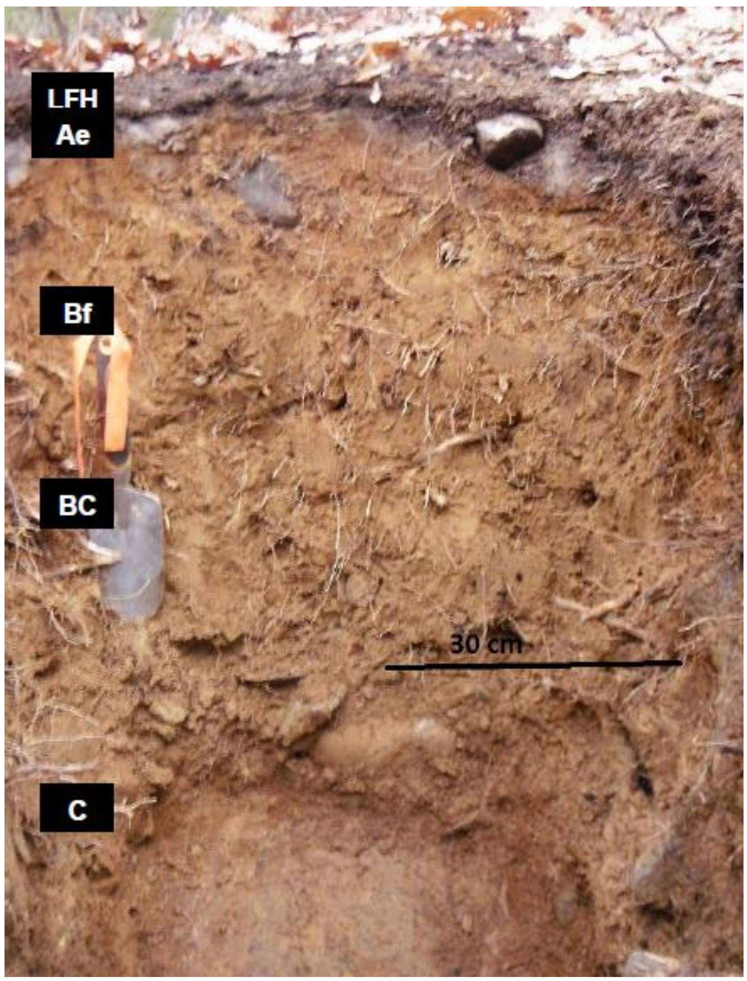

Figure 1: Soil Profile showing one organic horizon (LFH) and four distinct mineral horizons (Ae, Bf, BC, and C). Soil pit was approximately 70cm in depth.

Leachate sampling

Two types of lysimeters to facilitate collection of soil solutions were installed in each column, gravitational lysimeters and tension lysimeters. The gravitational lysimeters were constructed with funnels packed with leaching beads attached to a PVC pipe which then exited the column below the lysimeter surface. These lysimeters, draining freely under gravity, provided free water samples over field capacity which flows through the soil macropores following precipitation events (Andreasson, et al., 2009). The tension lysimeters have porous Teflon cups attached to the end of a 10 cm capillary tube, being designed to allow the sampling of pore water, essentially mimicking the root hair (10 cm porous part, glass fiber wire; Rhizosphere research products) which draws plant available water from smaller pores (meso or micropores) (Andreasson, et al., 2009). The mesocosom leaching experimental design is described in (Driscoll, 2013; section 2.4). A schematic of soil mesocosms and lysimeter sampling locations is described in Figure 2.

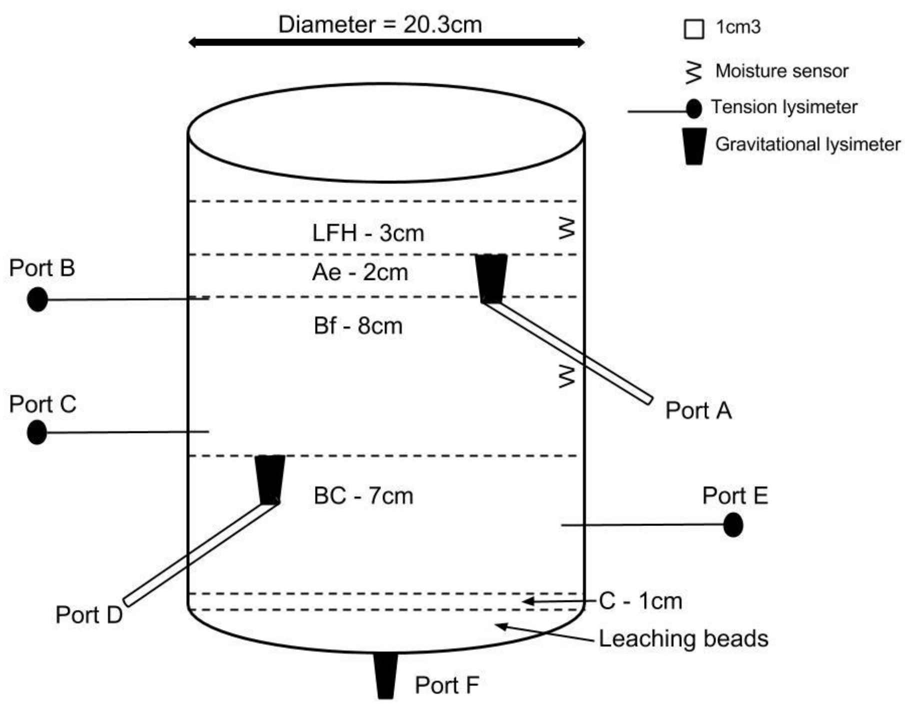

Figure 2: Soil mesocosm schematic depicting soil water sampling and moisture sensor locations within the simulated pedon.

Leachate samples were collected from both gravitational lysimeters and tension lysimeters after each rainfall event. Gravitational lysimeter samples were allowed to drain freely for 24 hours into partially sealed sample collection bottles. The bottles, located on the bench top below the soil mesocosms, were vented to allow gravitational flow to provide. Water samples of the gravitational flow through the soil macro pores above field capacity. After collection, the samples were filtered through a 0.45μm syringe filter. The tension lysimeters were sampled 24hours after each rain event by attaching a 10mL syringe to the tension lysimeters and removing the pore water sample under light tension. As the porous Teflon cup of the tension lysimeters has a mean diameter of 0.2μm, filtration after collection was not necessary.

Analytical Methods

The soil material characterization, including total and bioavailable metal concentrations can be found in Driscoll (2013); section 3. The leachate samples were analysed for a variety of parameters, including pH, electrical conductivity (EC), oxidation/reduction potential (E_H), cation quantification by ICP-MS, and anion quantification by Ion Chromatography. The analytical methods and results can be found in Driscoll (2013); section 2.4.

The UV measurements were carried out on Ultrospec 3000 (Pharmacia Biotech) for all leachate samples (gravitational and tension, n= ~1170). Samples were measured at room temperature, and deionised water was used as a blank every 20 samples. Initially, wavelength scanning was used to assess suitable wavelengths for one point absorbance measurements. Single point absorbance measurements were preformed on a small number of samples representing varying sample depths (n=25), for wavelengths 254 nm, 300 nm, 310 nm, and 320 nm. These samples were also analysed for dissolved organic carbon (DOC) by the non purgeable organic carbon (NPOC) method on a Shimadzu TOC-5000A (Shimadzu Corp.) with a Pt catalyst (680˚C). Samples were acidified with 2N HCl (to pH $\leq$ 2) and then sparged with Ultra zero air (Air Liquid Canada) for 5 minutes (300 mL/min) before analysis to remove all inorganic carbon as $CO_{2(g)}$. The performance of the instrument was checked by running standard solutions, a certified reference material (CWW-TOC-B, High Purity Standards, Delta Scientific), and blanks (de-gassed, acidified and sparged deionised water). All samples were corrected by subtracting the blank DOC value. The analysis was completed at an ISO 17025 accredited facility (Elliot Lake

Research Field Station of Laurentian University). 254 nm was chosen as the best wavelength and the remainder of the leachate samples were analysed at this wavelength. To relates absorbance at 254 nm to concentration of DOC, a calibration curve was established using a randomly selected subset of samples (n=62) which were quantified for dissolved organic matter by the NPOC method described above.

The concentration of DOC in the remaining lysimeter samples was calculated by least squares linear regression of the absorbance of the subset of samples at 254 nm and the concentration of DOC in these select samples.

Results and Discussion

UV absorbance and Dissolved Organic Carbon

The UV spectra obtained from various lysimeter samples (from 200 to 400 nm) showed a decrease in absorbance from approximately 220 nm to 400 nm. This is consistent with UV spectra obtained by Deflander & Gagne (2001) and suggests that any wavelength from 220nm to 400 nm could be chosen to estimate DOC in the sample, but that the lower the wavelength, the higher the sensitivity. Inorganic species like nitrate and bromide show significant UV absorption at less than 230 nm and should therefore be avoided (Deflander & Gagne, 2001).

Initially, four wavelengths (254, 300, 310, and 320 nm) were investigated to determine which one is best suited for estimating DOC concentration in leachate samples from various depths inside the soil profile. These were chosen because they fall within the target wavelengths from 230 to 400 nm and have all been previously investigated to estimate DOC in various sample types. The relationship between UV absorbance at 310 and 320 nm and DOC concentration has been found to be highly significant in lakes located in the Sudbury region (Beauclerc & Gunn, 2001). Absorbance measurements at 254 nm have been previously used to estimate DOC content in sediments (Deflander & Gagne, 2001) and soil pore water samples (Amrhein, et al., 1992).

Only samples from gravitational lysimeters (locations A, D, and F) were used for this initial study due to the larger samples volume collected. There were clearly two distinct groups observed when comparing the absorption results with the DOC concentrations analysed by TOC analyser, group 1 with samples from lysimeters A, and group 2 from lysimeters D and F. The absorption at 320 nm is shown in Figure 3 as an example of this group separation observed. All wavelengths tested showed a strong positive correlation between DOC measured by the TOC analyser and absorbance for samples from lysimeters in location A; however, only absorbance measurements at 254 nm showed a satisfactory correlation between the DOC concentration (Table 1). The higher sensitivity of 254 nm compared to other wavelengths increased the correlation between samples from lysimeters D and F and the concentration of DOC.

Increases in DOC concentrations resulted in linear increases in light absorbance at 254 nm (Figure 4). As in the initial wavelength investigation study, the randomly selected samples from all lysimeter locations separated into two distinct groups corresponding to the depth of the soil profile: A, B, and C at depths 3-11cm, and D, E, and F at depths 13-21cm (Figure 4). The concentration of the remaining lysimeter samples were calculated using the equations obtained through least-squares regression for both groups separately. For group 1, consisting of samples from lysimeters A, B, and C, the DOC concentration was estimated by

$$y = 25.6x + 3.12 \tag{1}$$

For group 2, consisting of samples from lysimeters D, E, and F, the DOC concentration was estimated by

$$y = 78.4x - 0.765 \tag{2}$$

where y is the concentration of DOC in mg/L, and x is the absorptivity at 254 nm for both equations 1 and 2. The R^2 values for equations 1 and 2 were equal to 0.865 and 0.825 respectively (Figure). Equation 1 indicates the presence of approximately 3 mg/L of non-UV absorbing DOC.

Table 1: least squared linear regression analysis of the absorbance at various wavelengths and the concentration of DOC determined by NPOC method for preliminary samples (A n=11, D+F n=14)

Lysimeter Sample	Linear Regression (R^2)			
	254 nm	300 nm	310 nm	320 nm
A	0.940	0.935	0.931	0.957
D & F	0.729	0.277	0.343	0.400

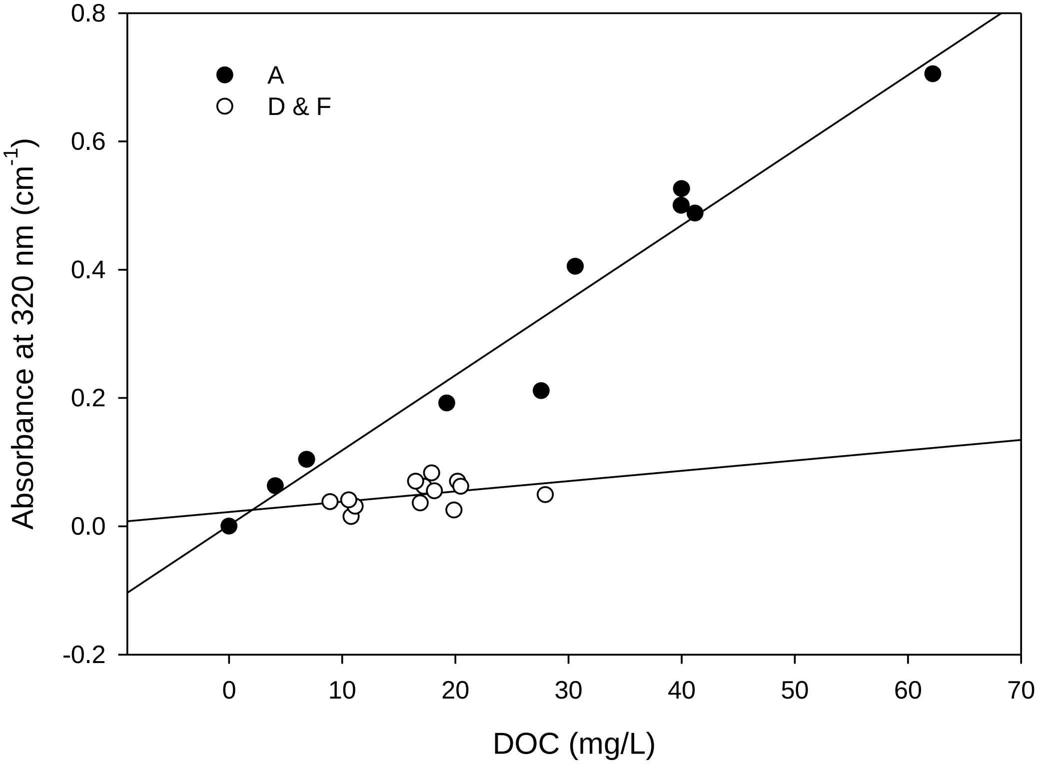

Figure 3: Relationship between dissolved organic carbon (DOC) as measured by non-purgeable organic carbon (NPOC) and absorbance at 320 nm. Letters (A, D, and F) correspond to sampling location within the soil mesocosms (Figure).

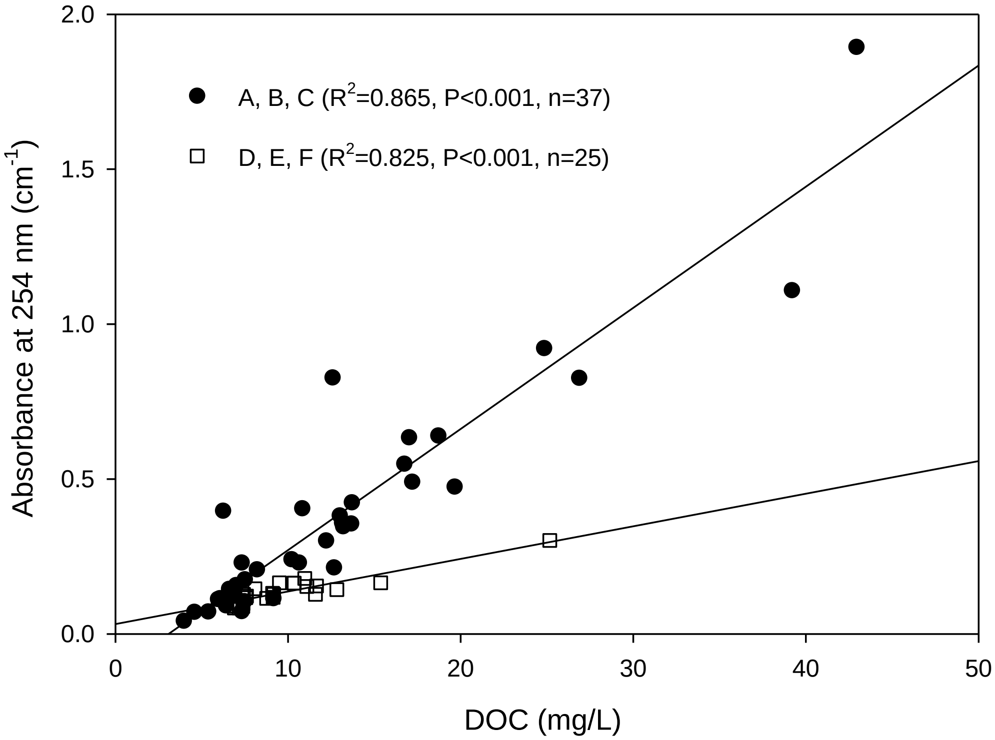

Figure 4: Relationship between dissolved organic carbon (DOC) as measured by non-purgeable organic carbon (NPOC) and absorbance at 254 nm. Letters (A-F) correspond to sampling location within the soil mesocosms (Figure 2).

Absorbance measurements at 254 nm have been previously used to estimate DOC content in sediments (Deflander & Gagne, 2001) and soil pore water samples (Amrhein, et al., 1992). Both of these studies also showed linear relationships between DOC concentration as measured by traditional laboratory techniques, and absorbance at 254 nm. Although both studies had samples from various depths, only one least squares regression line was required to estimate the concentration of DOC in all samples (Deflander & Gagne, 2001; Amrhein, et al., 1992). The two distinct groups of samples in the present study are most likely caused by the large variations in physical and chemical properties of the different soil horizons from where the leachates were sampled (Figure 1, 2). Lysimeter A leachates are sampled directly under the LFH organic horizon of the soil and are therefore darker in colour and generally higher in DOC concentration. The darker colour is most likely due to higher concentrations of humic acids which are retained throughout the mineral horizons and essentially filtered, decreasing the leachate colour from a light tea colour in samples A, B, and C to a clear solution in samples D, E, and, F. There is most likely a difference in DOC composition in the samples from group 1 compared to group 2, where solutions in group 1 contain a higher concentration of humic acids which are retained in the mineral soil horizons, and group 2 contain a higher concentration of fulvic acids which remain soluble and move downward through the soil column (Fellman, et al., 2008; Ussiri & Johnson, 2003). A study by Fellman, et al., (2008) found absorbance at 254 nm to be a good indicator of differences in chemical quality of soil DOM from different soil types.

Potential Interferences

There are a variety of inorganic species which absorb light at (or near) the UV wavelength of 254 nm used for this study. These species can interfere with the absorbance of DOC (Weishaar, et al., 2003). The correlation between these interfering species and the UV absorbance of DOC was investigated.

Inorganic anions like nitrate and nitrate can absorb light in the visible spectral range close to 254 nm (Roig, et al., 2007; van den Broeke, et al., 2006). The concentrations of nitrate varied greatly and high concentration were found in all sample locations (Table 2). Nitrite was not detected in the samples and therefore cannot be investigated further. The relatively high mean nitrate concentrations (all above 2.5 mg/L) and the high maximum concentrations could potentially interfere with the absorption of DOC at this wavelength (Table 2). However, we would expect that the higher the nitrate concentration, the higher the absorbance, according to Beer's Law which states that the absorbance should be additive. Instead we see a negative linear correlation between nitrate and the absorbance at 254 nm (Table 2). This indicates that, although there may be a relationship between the nitrate concentration and the DOC concentrations in the samples, the concentration of nitrate most likely does not affect the absorbance of the sample at the target wavelength. A study by Weishaar, et al., (2003) found the absorbencies of DOC and nitrate to be additive but suggested that only samples with nitrate concentrations greater than 40 mg/L significantly affected the absorption at 254 nm. No samples in this study were found to have concentrations of nitrate above this threshold; therefore, as long as lysimeter samples are not collected from an area which has been amended with nitrate, the measurements of DOC by absorption should not be affected by the nitrate concentration in the sample. Nitric acid is sometimes used as a sample preservative after collection but should not be added to samples intended for UV absorptivity measurements.

Table 2: Possible anionic interference of nitrate (ranges and means in mg/L) on dissolved organic carbon absorption at 254 nm. R^2 values calculated by least squares linear regression.

Lysimeter Sample	NO_3^- (DL = 0.03 mg/L)	
	range (mean)	R^2
A	<DL-17.6 (3.89)	-0.004
B	0.304-31.3 (7.21)	-0.019
C	<DL-20.2 (5.74)	-0.138
D	0.057-19.6 (5.25)	-0.135
E	0.048-18 (2.73)	-0.457
F	<DL-18.8 (3.54)	-0.299

<DL = under detectable limit

Transition metals have the ability to form hydrated metal complexes which can absorb light in the visible spectrum and therefore can interfere with DOC measurements by absorption (Rayner-Canham & Overton, 2003). Eleven transition metals were quantified in the leachate samples by ICP-MS (Co, Cr, Cu, Fe, Mn, Mo, Ni, Ta, Ti, V, Zr) due to their presence in the soil (Driscoll, 2013; section 2.4.2.2). Molybdenum, Ta, V, and Zr were found in very low concentrations (≤ 5 μg/L) and therefore were not investigated further.

Of the remaining transition metals, only Cu, Fe, and Ti showed strong positive linear correlations between absorbance at 254 nm and the metal concentration in the leachate samples (Table 3). Iron and Ti showed very strong linear correlations in sample locations A and B, with R^2 values of over 0.8 (Table 3). The Ti concentrations in solution are relatively low, with maximum values not exceeding 0.02 mg/L (Table 3). Since the concentration is low compared there are most likely only very small increases in absorbance caused by varying Ti concentrations in the sample. Similarly, when Fe is present in small concentrations (from 0-0.5 mg/L) there is little increase in absorbance at 254 nm (Weishaar, et al., 2003). The leachate solutions sampled contain up to 2.85 mg/L of Fe; therefore, the concentration of DOC may be overestimated in samples which are high in Fe. A Fe correction should be investigated and applied to samples with concentration of Fe above 0.5 mg/L. This can be done by spiking a sample with Fe and measuring the increase in absorbance due to the increase in Fe concentration.

There is a positive correlation between the Cu concentration in lysimeter samples A and absorbance at 254 nm (Table 3). This correlation suggests that Cu may interfere with the absorbance of DOC causing overestimation of DOC when Cu concentrations are high in solution. The correlation is not very strong, suggesting that the increase in absorption due to Cu in solution may not have a significant effect on the estimation of DOC.

Other transition metals showed very weak positive or negative correlations with absorbance at 254 nm, suggesting that their presence in the sample does not interfere with the absorbance of DOC in the solution (Table 3). Some samples of Co, Cu, and Ni demonstrated strong negative correlations with absorbance at 254 nm (Table 3). This may demonstrate a correlation between DOC and the metals in solution, but the correlation should not change the absorbance measurement due to interference.

Conclusions

Absorbance at 254 nm can be used to estimate the DOC concentration of leachate samples in highly metal contaminated soils, such as those found in the Sudbury region. Gravitational and tension lysimeter samples can be quantified using this method; however, the depth at which the sample is taken affects the relationship between the absorbance at 254 nm and the concentration of DOC. In this study, samples located in the top 11 cm of the soil profile and the bottom 13 to 21 cm of the soil profile resulted in two distinct groups and therefore two separate equations were necessary to estimate DOC concentration. High concentrations of Fe, Cu, and Ti can lead to overestimations of DOC concentrations and therefore if high concentrations of these metals are found, corrections should be applied. Other transition metals like Ni, Co, Cr, and Mn, and inorganic anions like NO_3^- do not cause increase in absorbance at 254 nm in the concentration ranges observed in this experiment.

Table 3. Possible transition metal interferences on dissolved organic carbon absorption at 254 nm. Ranges and means in mg/L or µg/L in solution. R^2 values calculated by least squares linear regression.

Lysimeter Sample	Cobalt (DL = 0.6 µg/L)		Chromium (DL = 0.06 µg/L)		Copper (DL = 0.002 mg/L)	
	range (mean) µg/L	R^2	*range (mean) µg/L*	R^2	*range (mean) mg/L*	R^2
A	0.67-40.1 (8.3)	-0.790	0.205-58.1 (2.05)	0.090	0.053-0.77 (0.23)	0.467
B	6.38-79.4 (23.6)	-0.202	0.267-29.8 (2.45)	0.079	0.117-1.59 (0.48)	0.072
C	11.2-85.8 (43.7)	-0.233	0.142-23 (1.45)	0.026	0.015-0.12 (0.05)	-0.208
D	13.5-149 (52.6)	-0.87	0.134-27.4 (1.68)	0.017	0.024-0.303 (0.08)	-0.022
E	23-129 (51.8)	-0.354	0.307-21.9 (1.82)	0.064	0.004-0.072 (0.02)	-0.389
F	9.77-125 (50.5)	-0.407	0.441-27.2 (2.27)	0.018	0.01-0.141 (0.04)	-0.361

Lysimeter Sample	Iron (DL = 0.004 mg/L)		Manganese(DL = 0.02 mg/L)		Nickel (DL = 0.004 mg/L)	
	range (mean) mg/L	R^2	*range (mean) mg/L*	R^2	*range (mean) mg/L*	R^2
A	0.07-2.85 (0.52)	0.865	<DL-0.881 (0.18)	-0.127	0.018-1.17 (0.24)	-0.064
B	0.05-2.35 (0.41)	0.943	0.036-2.04 (0.54)	-0.088	0.157-2.02 (0.53)	-0.137
C	0.02-5.72 (1.15)	0.334	0.03-2.21 (0.88)	-0.098	0.142-1.05 (0.5)	-0.262
D	0.01-4.92 (0.26)	0.134	0.032-2.54 (0.92)	-0.036	0.159-1.58 (0.58)	-0.142
E	0.02-9.58 (3.02)	0.149	0.072-2.95 (1.22)	-0.193	0.162-0.72 (0.29)	-0.415
F	<DL-0.195 (0.04)	-0.079	0.064-2.03 (1.03)	-0.311	0.069-0.788 (0.33)	-0.396

Lysimeter Sample	Titanium (DL = 1µg/L)	
	range (mean) µg/L	R^2
A	<DL-19.7 (3.59)	0.922
B	<DL-18.7 (4.61)	0.837
C	<DL-2.15 (0.85)	0.152
D	<DL-2.29 (0.91)	0.362
E	<DL-2.52 (1.61)	0.095
F	<DL-3.14 (1.69)	0.293

DL = detection limit, <DL = under detectable limit

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Appendix C: Strontium isotope ratio as a tracer for the movement of limestone dissolution products through contaminated soil: a feasibility study using ICP-QMS

Abstract

The stability and longevity of limestone added during the reclamation of Sudbury soils is unknown. To assess the stability of the soil it may be useful to determine how much of the products added by the limestone dissolution are still present in the soil system. Preliminary results show that a RSD of 0.01% for $^{87}Sr/^{86}Sr$ is attainable by ICP-QMS using NIST SRM 987 ($SrCO_3$) solutions of 5 to 50 μg/L. Due to the relatively large variations in Sr isotopic signatures of the soil material compared to the limestone material, ICP-QMS is a potential candidate for tracing limestone through soil provided proper sample purification, instrument optimisation, and data corrections are applied.

Introduction

During the reclamation of soils in Sudbury, Ontario, Canada, limestone was added as an amendment to contaminated soils with low pH. Recent assessments of reclaimed Sudbury soils have found that some sites still have elevated pH levels after 30 years post liming (Nkongolo, et al., 2013); however, the future stability of the soils is unknown. To assess the stability of the reclaimed sites, it may be useful to determine how much of the products added by the limestone dissolution are still present in the soil system. This is a difficult question to answer because we are unable to determine if the Ca and Mg present in the soil are derived from atmospheric deposition, soil mineral weathering, or weathering of limestone amendments. Calcium and Magnesium isotopes fractionate in nature, therefore measuring them directly proves extremely difficult in a dynamic soil system with today's technology. Strontium isotopes do not measurably fractionate in nature and since Sr is geochemically similar to Ca, it can be used to describe Ca (Graustein, 1989; Capo, et al., 1998).

Strontium isotopes have been successfully used to determine the supply and loss of Sr (and by proxy, Ca) to the soil exchange complex in forest ecosystems (Jacks, et al., 1989; Miller, et al., 1993; Blum, et al., 2002; Dijkstra, et al., 2003; Belanger & Holmden, 2010). However, monitoring the movement of limestone dissolution products through soil using Sr isotopes has not been previously investigated to the knowledge of the author. The goal of this study is to assess the feasibility of monitoring the movement of limestone dissolution products through contaminated soil.

Strontium isotope chemistry

Strontium has four naturally occurring stable isotopes: ^{84}Sr (0.56%), ^{86}Sr (9.87%), ^{87}Sr (7.04%), and ^{88}Sr (82.53%). Rubidium^{87} undergoes β^- decay to ^{87}Sr (half life = 4.88×10^{10} years; decay constant $\lambda = 1.42 \times 10^{-11}$ years^{-1}) (Capo, et al., 1998). Therefore, the ratio of $^{87}Sr/^{86}Sr$ will increase over time with older rocks containing a higher ratio than younger ones. This ratio is used to date geological materials. The highest abundances of Rb are found in K-bearing minerals and clays (Capo, et al., 1998). The abundance of Rb in carbonates are much lower, since calcium carbonate permits Sr^{2+} to replace Ca^{2+} but excludes Rb^+ resulting in calcite having a very low Rb/Sr ratio and its $^{87}Sr/^{86}Sr$ ratio not being significantly altered by radioactive decay of ^{87}Rb to ^{87}Sr (Faure, 1991).

Soil parental material containing high concentrations of Rb often have high $^{87}Sr/^{86}Sr$ values ($\geq$0.71), whereas some limestones and dolomites have relatively low $^{87}Sr/^{86}Sr$ values (0.707-0.709) (Capo, et al., 1998). Due to this difference in Rb content resulting in differences in strontium isotopic ratios, the mixing of high $^{87}Sr/^{86}Sr$ values from soil material and low $^{87}Sr/^{86}Sr$ values from limestone may be traceable in soils which have had limestone added as an amendment. This may be possible in Sudbury soils which do not contain any carbonate parental materials. Theoretically, the lower the $^{87}Sr/^{86}Sr$ value at a certain soil depth, the further the limestone has penetrated the soil. This is important from a reclamation perspective because it could estimate the amount of Sr remaining in the soil which was added from the limestone amendments. Since Sr is a useful proxy for Ca, this measurement could assess the amount of Ca remaining from limestone additions. If strontium is to be used as an ecosystem tracer, the isotopic composition of Sr in the system as well as the isotopic variation of all sources must be determined, i.e., the parent material, rain, ground, and surface waters, and limestone amendments.

Analytical Methods

For Sr isotopic measurements, it is important to be very clean to avoid contamination during sample collection, storage, preparation and extraction. Ultrapure water should always be used. Clear laboratory conditions should be followed for extraction in Teflon or polypropylene beakers / vials and evaporation should take place in filtered air. Chromatographic columns should be constructed with quartz glass, poly, or Teflon. Reagents should be ultrapure or further distilled and blanks should be monitored (Capo, et al., 1998). The ICP-MS equipment should be cleaned and there should be designated glass wear (nebulizer, spay chamber, etc), tubing, and cones for isotope work.

Instrumentation

Strontium isotopic composition is generally measured with a thermal ionisation mass spectrometer (TIMS) because of its high precision (0.002% RSD) (Monna, et al., 1998). Analysis by TIMS can be time consuming because of low sample throughput and also tedious due to difficult sample preparation. Inductively coupled plasma mass spectrometer (ICP-MS) can be used as an alternative to TIMS in certain conditions. The isotope ratio precision obtained by quadrupole-based ICP-MS instruments (ICP-QMS) is poor compared to TIMS ($\geq$0.1 % RSD) (Vanhaecke, et al., 1999). When larger variations in Sr isotopic values are expected, either due to age (>50 million years) and/or large variations in Rb/Sr ratios, ICP-QMS is a valid alternative to TIMS. Multicollector ICP-MS instruments (MC-ICP-MS) are a relatively new technology and can obtain relative standard deviations (RSD) values close to that of TIMS (Waight, et al., 2002; Yang, 2009). The present study evaluates if ICP-QMS can be used to trace limestone dissolution products through a podzolic soil profile from the Sudbury region.

Optimization of instrument parameters

The parameters which can be optimized for the instrument are: RF power, Ar nebulizer flow, Ar auxiliary gas flow, Ar cooling gas flow. The parameters which can be optimized for isotopes are: Dwell time, points / peak, number of sweeps per reading, reading pre replicates, total intensity, and acquisition time. It is helpful to use parameters similar to those used in other studies as a guideline for optimization (Almeida & Vasoncelos, 2001; Appelblad, et al., 2001). Parameters can be systematically changed one at a time to determine the best precision (lowest RSD). Optimizing instrument parameters will lead to a smaller RSD and therefore better precision. The dwell time may be altered to best fit each individual isotope. Using a different dwell time for major and minor isotopes can improve counting statistics for the minor isotope, however this improvement is often negligible compared to the overall uncertainty of the data due to other parameters or corrections (Appelblad, et al., 2001). Even so, an optimal dwell time ratio for $^{87}Sr/^{86}Sr$ should be found.

Interferences

A variety of interferences must be removed or corrected for when measuring $^{87}Sr/^{86}Sr$ ratio by ICP-QMS. The most obvious of interferences is from $^{87}Rb^{+}$ due to its isobaric overlap with $^{87}Sr^{2+}$. Rubidium can be removed from the sample before analysis by ion exchange separation (Vanhaecke, et al., 1999; Almeida & Vasoncelos, 2001). Rubidium can also be removed from solution using Sr specific resin such as Sr-Spec (Capo, et al., 1998), but this resin is more expensive ion exchange resins. Removing Rb also has the added benefit of removing other cations such as Na, K, Mg, Fe, and Ca. Rubidium concentrations in solutions should be monitored and if any detectable Rb is present after purification, a mathematical correction can be applied. To correct for Rb the natural abundance ratio of $^{87}Rb/^{85}Rb$ (0.386) is multiplied by the net signal at *m/z* 85 and then subtracted from the signal at *m/z* 87 (Almeida & Vasoncelos, 2001). Krypton^{86} can also interfere with ^{86}Sr measurements. High purity grade Ar gas should be used to reduce this interference; however, Kr should be monitored to ensure that it does not interfere. If Kr is present (which is most likely due to slight impurities in Ar gas), natural abundance ratios can be used to correct, similar to ^{87}Rb correction factor. Calcium interferences such as, $^{46}Ca^{40}Ar$ (at *m/z* 86), $^{48}Ca^{40}Ar$ (at *m/z* 88), and $^{48}Ca^{37}Cl$ (at *m/z* 85) are all possible and therefore Ca should be monitored to ensure it has been removed during sample purification.

Data correction

The isotope ratio data obtained on an ICP-MS instrument must be corrected for mass bias (Almeida & Vasoncelos, 2001). There are two types of data correction which can be used to correct for mass bias, internal correction and external correction. Internal correction uses the natural abundance ratio of $^{88}Sr/^{86}Sr$ of 8.37521 to monitor instrument and sample mass bias.

External correction for mass bias uses an isotope ratio standard such as NIST SRM 987 ($SrCO_3$) to standardize the data. This external correction is preferred some cases (Vanhaecke, et al., 1999; Almeida & Vasoncelos, 2001) whereas internal correction is sometimes preferred (Monna, et al., 1998). By including the measurement of ^{88}Sr during analysis, both internal and external corrections can be evaluated and the best could be applied (Almeida & Vasoncelos, 2001).

Dead time correction is also important to consider for Sr isotope analysis by ICP-QMS. The dead time of the detector (when no counting is taking place) leads to counting losses which causes inconsistencies in isotope abundance ratio measurements (Nelms, et al., 2001). Calculating a dead time correction may be avoidable if the concentration of Sr measured is not too high and the count rate does not exceed approximately 0.3 MHz (Appelblad, et al., 2001), in this case the instrument software may be able to accurately automatically correct for dead time. Most pulse counting systems show dead times from 10-30ns (Begley & Sharp, 1997).

Results and Discussion

ICP-QMS investigation of Sr solutions

Standard solutions of NIST SRM 987 were evaluated over a range of concentrations (5-50 µg/L) to determine the relative standard deviation of $^{87}Sr/^{86}Sr$ measurements. An ELAN DRC II Axial (Perkin Elmer SCIEX, property of Geolabs, Sudbury ON.) ICP-QMS was used for this analysis. Each sample was analysed using 90 replicates per sample and 25 scans pre replicate. All other instrument parameters were previously optimized for routine use, which is instrument specific. It would be advised to begin with manufactures suggested instrument parameters and then systematically tune each one to obtain optimal RSD values (as described above). Instrument measurements were corrected for ^{86}Kr and ^{87}Rb present using natural abundance ratios of Kr and Rb. For the rage of 5 to 50 µg/L, the RSD was found to be 0.0169% for $^{84}Sr/^{86}Sr$, 0.0099% for $^{87}Sr/^{86}Sr$, and 0.0105% for $^{88}Sr/^{86}Sr$. For a single concentration of 50 µg/L the RSD value of $^{88}Sr/^{86}Sr$ is improved to 0.0092%. This RSD value may be slightly improved by changing some instrument parameters (like those described above) but these RSD values can be thought of as best case scenarios since the samples are pure $SrCO_3$ solutions of known isotopic ratios. Real samples containing more complex matrixes (i.e. soil extracts which have been purified by ion exchange resins) must be evaluated to determine if a RSD of this low can be achieved. However, the initial tests are promising and suggest that it may be possible to achieve a low RSD and therefore distinguish between samples with relatively small changes in $^{87}Sr/^{86}Sr$ ratios.

Sr isotopic composition of Soil and Limestone

In order to determine if the Sr isotopic signatures of the limestone amendments and the soil horizons differed enough to be distinguishable by ICP-QMS, two soil and two limestone samples were measured using TIMS at The Pacific Centre for Isotopic and Geochemical Research (B.C., Canada) (Table 1). A relatively large $^{87}Sr/^{86}Sr$ ratio difference can be seen between the limestone samples and the soil samples, which is promising for the use of $^{87}Sr/^{86}Sr$ ratios as a tracer for the movement of limestone dissolution products. The Sr isotopic ratio of the soil parent material and the Bf mineral horizon (which is located approximately 30cm above the parental material) differ, but not to a large extent (Table 1).

Table 1: Sr isotopic composition of two limestone samples and of the parental material horizon (C) and a mineral horizon (Bf) of a podzolic soil form the Sudbury region; analyzed by TIMS.

Sample	$^{87}Sr/^{86}Sr$ Normalized	Error (+/-2s)
Calcitic limestone	0.708861373	0.000009
Dolomitic limestone	0.70877504	0.000008
Soil parental material	0.726446286	0.000009
Soil Bf mineral soil	0.721253034	0.000009

Potential application to field or laboratory studies

Since it has been shown that Sr isotopic signature of limestone and soil mineral material from the Sudbury region can most likely be distinguished by ICP-QMS, Sr isotopic ratio measurements can be applied to field and laboratory studies to evaluate the movement of limestone dissolution products through soil. To determine the source of Sr (i.e., from limestone or from soil parent material) mixing equations are used with Sr isotope measurements to determine the relative contribution of individual inputs into the system (Capo, et al., 1998; Nelms, et al., 2001; Shand, et al., 2009). The source of Sr in a sample can also be described graphically be visually assessing where the data points cluster in relation to end members. For example, Blum, et al., (2002) uses a graph of $^{87}Sr/^{86}Sr$ vs. Ca/Sr to determine which samples are most similar to a variety of end members. The same approach can be used to assess if the Sr isotopic signature of each soil horizon is more closely related to limestone or soil parent material.

Conclusions and Future work

Due to the relatively large variations in Sr isotopic signatures of the soil material compared to the limestone material, ICP-QMS is a potential candidate for tracing limestone through soil. However, accurate measurements of Sr isotopic rations can only be obtained with proper sample purification, instrument optimisation, and data correction. It is also important to note that in a dynamic soil ecosystem, all sources of Sr must be evaluated to be successfully used as any type of ecosystem tracer.

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Appendix A Tables

Table 10: Iron and Aluminum concentrations of three extractions: pyrophosphate, dithionite, and acid oxalate. All values in % dry weight.

	Pyrophosphate extraction (Organically bound Fe and Al)		Dithionite extraction (Non Si Fe and Al)		Acid Ammonium Oxalate (amorphous Fe and Al)	
Horizon	**Al**	**Fe**	**Al**	**Fe**	**Al**	**Fe**
LFH	0.16	0.88	0.22	1.65	0.12	0.84
Ae	0.50	0.11	0.07	0.22	0.04	0.10
Bf	0.26	0.16	0.54	0.99	0.70	0.46
BC	0.17	0.08	0.35	0.77	0.45	0.34
C	0.23	0.21	0.44	1.04	0.34	0.48

Table 11: Elemental analysis of all limestone size fractions. Samples digested by three acid digest and analysed by ICP-MS. All values in % or mg/kg dry weight.

		Element						
Size (mm)	Size fraction	Ca %	Mg %	Ca+Mg %	Al mg/kg	As mg/kg	B mg/kg	Ba mg/kg
Calcitic limesone								
>4	1.6	28.4	0.294	28.7	14900	1.2	9.99	98.3
4-2	11	34.7	0.382	35.1	537	0.534	13.2	5.85
2-01	11	33.1	0.355	33.5	488	0.494	18.2	6.35
1-0.71	5	31.5	0.369	31.9	1480	0.912	20.4	13
0.71-0.5	7	32.3	0.433	32.7	1420	0.644	22.3	13.8
0.5-0.425	3	34.3	0.53	34.8	2620	0.865	16.7	17.6
0.425-0.21	19	34.1	0.578	34.7	4350	1.57	15.3	65.5
0.21-0.15	11	33.8	0.604	34.4	4780	0.844	14.8	79.5
0.15-0.075	16	38.4	0.772	39.2	2840	0.992	18.4	35.3
0.075-0.045	9	37.1	0.911	38.0	2000	1.07	18.2	17.4
<0.045	8	36.1	0.705	36.8	2680	2.02	21.6	18.6
Dolomitic Limestone								
>4	0.50	22.6	13.6	36.2	334	1.13	21.2	1.65
4-2	19.01	24.3	14.2	38.5	366	1.65	22.1	2.08
2-01	19.85	25.4	14.7	40.1	452	2.16	24.6	3.61
1-0.71	7.67	23.3	13.5	36.8	364	1.53	21	6.35
0.71-0.5	6.22	23.9	14.1	38	461	2.02	17.3	8.34
0.5-0.425	2.52	25.5	14.9	40.4	492	2.12	21.8	9.99
0.425-0.21	9.49	26.2	15.2	41.4	682	2.5	22.2	18.5
0.21-0.15	5.69	24.8	14.4	39.2	857	2.76	20.5	23
0.15-0.075	14.00	23.4	13.6	37	716	2.32	21.4	20.3
0.075-0.045	7.67	23.9	14.1	38	751	2.12	23.1	28
<0.045	7.37	21.3	14.2	35.5	834	2.55	23	35.4

<DL under detectable limits

Table 11: cont.

Size (mm)	Size fraction	Element Cd mg/kg	Co mg/kg	Cr mg/kg	Cu mg/kg	Fe mg/kg	K mg/kg	Mn mg/kg
Calcitic limesone								
>4	1.6	0.199	1.39	14	2.86	2700	8740	74.2
4-2	11	<DL	1.24	1.93	13.8	1470	405	102
2-01	11	<DL	1.04	2.12	4.74	1320	448	101
1-0.71	5	<DL	1.54	2.81	6.98	2100	754	102
0.71-0.5	7	<DL	2.59	3.02	6.65	2390	735	99.2
0.5-0.425	3	<DL	2.98	2.87	12.2	2740	1110	114
0.425-0.21	19	<DL	3.08	3.65	23.3	2890	2820	110
0.21-0.15	11	<DL	2.16	3.62	28.6	2770	3620	112
0.15-0.075	16	0.147	2.66	4.02	29.3	2930	1690	133
0.075-0.045	9	0.0672	3.4	5.4	52.5	2770	962	126
<0.045	8	0.163	5.07	9.28	125	3450	1180	128
Dolomitic Limestone								
>4	0.50	<DL	0.348	1.93	0.694	1960	129	395
4-2	19.01	<DL	0.481	2.05	14	1870	193	368
2-01	19.85	0.94	0.547	3.58	3.45	2810	251	397
1-0.71	7.67	0.916	0.435	2.53	2.07	2100	182	383
0.71-0.5	6.22	2.87	0.46	2.58	3.15	2540	224	382
0.5-0.425	2.52	3.97	0.583	2.89	7.99	2770	243	423
0.425-0.21	9.49	5.4	0.667	5.05	12.8	2890	321	432
0.21-0.15	5.69	3.27	0.884	5.36	16.2	2960	349	434
0.15-0.075	14.00	2.04	0.761	2.52	10.2	2790	288	400
0.075-0.045	7.67	1.65	1.06	3.03	13.6	2860	309	409
<0.045	7.37	1.54	0.844	3.95	20.9	2870	372	432

Table 11: cont.

Size (mm)	Size fraction	Element Na mg/kg	Ni mg/kg	P mg/kg	Pb mg/kg	Rb mg/kg	Se mg/kg	Sn mg/kg
Calcitic limesone								
>4	1.6	1190	9.92	138	2	42.1	<DL	0.851
4-2	11	<DL	12.2	70.4	1.91	1.27	<DL	0.754
2-01	11	<DL	8.72	71.5	4.09	1.36	<DL	7.98
1-0.71	5	101	9.71	73.3	4.62	3.14	<DL	9.83
0.71-0.5	7	133	11.8	87.2	2.79	2.68	<DL	4.25
0.5-0.425	3	597	13.7	77.9	4.24	4.49	<DL	5.16
0.425-0.21	19	727	21.8	87.5	11.1	9.24	<DL	85.4
0.21-0.15	11	758	16.3	75.6	22.6	12.4	<DL	133
0.15-0.075	16	553	22	100	30.4	6	<DL	171
0.075-0.045	9	110	31.1	92.7	42.5	3.6	<DL	224
<0.045	8	<DL	59	110	52.1	5.12	<DL	246
Dolomitic Limestone								
>4	0.50	<DL	2.6	21.1	17.9	<DL	<DL	<DL
4-2	19.01	<DL	3.34	16.7	13.3	0.268	<DL	0.733
2-01	19.85	<DL	4.39	23.5	232	0.516	<DL	6.89
1-0.71	7.67	<DL	3.37	12.4	49.3	0.331	<DL	5.11
0.71-0.5	6.22	<DL	3.7	20.9	33.4	0.44	<DL	4.78
0.5-0.425	2.52	<DL	4.56	25.6	128	0.503	<DL	6.51
0.425-0.21	9.49	<DL	5.25	27	572	0.744	<DL	6.85
0.21-0.15	5.69	<DL	6.37	29.3	438	0.999	<DL	12.4
0.15-0.075	14.00	<DL	5.65	25.4	365	0.828	<DL	16.4
0.075-0.045	7.67	<DL	5.57	25.9	221	0.843	<DL	22.5
<0.045	7.37	<DL	6.21	27.6	167	1.09	<DL	40.3

Table 11: cont.

Size (mm)	Size fraction	Element Sr mg/kg	Ti mg/kg	V mg/kg	Zn mg/kg
Calcitic limesone					
>4	1.6	165	374	12.5	9.5
4-2	11	169	43.1	4.65	8.59
2-01	11	165	36.9	4.11	3.78
1-0.71	5	163	70.6	5.65	5.46
0.71-0.5	7	162	66.8	5.4	5.44
0.5-0.425	3	173	92.1	6.76	7.13
0.425-0.21	19	175	99.8	7.03	12.9
0.21-0.15	11	170	91.6	6.78	17.8
0.15-0.075	16	185	128	8.2	31.1
0.075-0.045	9	167	111	7.81	38.7
<0.045	8	166	164	9.13	55.5
Dolomitic Limestone					
>4	0.50	79.7	13.7	2.54	27.9
4-2	19.01	82.9	24.5	3	25.9
2-01	19.85	133	33.1	3.44	686
1-0.71	7.67	142	28.6	2.94	543
0.71-0.5	6.22	219	33.2	3.25	1920
0.5-0.425	2.52	250	34.3	3.48	2610
0.425-0.21	9.49	399	43.9	3.79	2890
0.21-0.15	5.69	321	53.6	3.91	2050
0.15-0.075	14.00	233	49.1	3.64	1350
0.075-0.045	7.67	213	54.4	3.79	1070
<0.045	7.37	211	67	4.06	1020

Table 12: Concentration of calcium and magnesium from small limestone columns. Analysed by ICP-MS

Small Calcite Column			Small Dolomite Column		
Time (days)	Ca (mg/L)	Mg (mg/L)	Time (days)	Ca (mg/L)	Mg (mg/L)
0	0.269	0.028	0	0.205	0.0125
4	25.6	1.42	4	11.8	4.39
7	22.1	0.953	7	10.2	3.65
11	20.5	0.789	11	7.51	3.57
14	19.9	0.734	14	7.6	3.55
18	22.9	0.472	18	8.99	4.38
21	16.8	0.338	21	8.01	3.53
25	13.1	0.207	25	5.38	2.56
28	14.7	0.263	28	5.75	2.95
32	13.5	0.232	32	4.62	2.84
35	13.4	0.181	35	4.93	2.14
39	13.6	0.162	39	5.11	2.11
42	11.1	0.231	42	4.09	2.83
47	11.5	0.239	47	3.88	2.74
49	14.6	0.173	49	5.84	2.81
53	14.3	0.173	53	4.48	2.41
56	14.5	0.209	56	4.67	2.46
60	13.7	0.169	60	4.25	2.54
63	14.6	0.166	63	4.86	2.65
67	14.2	0.219	67	4.22	3.00
70	11.9	0.204	70	4.05	2.54
74	12.6	0.184	74	4.14	2.74
77	13.4	0.171	77	3.89	2.25
82	12.7	0.158	82	3.94	2.36
84	14.8	0.181	84	5.49	2.97
88	18.1	0.192	88	5.29	2.95
91	11.1	0.158	91	4.38	2.43
95	12.9	0.158	95	3.45	1.86
98	11.4	0.145	98	4.57	2.39
103	13	0.146	103	3.77	2.05
105	12.2	0.14	105	4	2.17
109	14.4	0.162	109	4.27	2.19
112	13.2	0.207	112	4.29	2.21
116	13.4	0.183	116	4.11	2.05
119	13	0.2	119	4.37	2.18
123	12.5	0.184	123	1.66	1.91
126	10.2	0.152	126	2.71	1.53
130	5.48	0.161	130	3.41	1.96
133	10.5	0.15	133	4.79	2.24
138	11.6	0.152	138	3.09	1.82
140	11.6	0.155	140	4.13	2.03
144	10.3	0.105	144	3.22	1.76
147	11.8	0.157	147	4.58	2.16
151	11.9	0.142	151	4.07	2.15
154	8.25	0.17	154	3.84	1.97
172	15.6	0.216	172	5.37	2.37

Table 13: Soil mesocosm leachate experiment data for all metals, non-metals, pH, EC, Eh, and volumes collected.

		Element, Unit, Detection Limit						
Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
0	1A	627	46.5	31.9	14.6	1070	<DL	4.09
0	1B	907	5.09	29.9	79.8	2360	1.74	15.6
0	1C	281	1.13	11.6	161	1690	2.41	29
0	1D	350	<DL	13.2	188	1680	2.77	32.4
0	1E	397	<DL	9.23	182	4570	1.77	36.8
0	1F	1010	<DL	10.8	166	5900	1.81	62.7
0	2A	633	49.8	10.4	21.7	660	<DL	2.67
0	2B	1240	6.84	30.3	58.1	1690	1.23	10.1
0	2C	312	1.92	12.9	185	1700	3.03	42.6
0	2D	460	1.74	21.1	244	2390	3.77	43.4
0	2E	317	<DL	9.5	126	2620	1.15	26.3
0	2F	559	<DL	10.5	86.6	3480	0.836	27.7
0	3A	745	41.5	15.4	11.9	1000	<DL	3.35
0	3B	512	2.53	20.4	103	1760	1.52	14.7
0	3C	258	<DL	12.1	180	1730	2.93	39.9
0	3D	432	4.2	20.4	203	3900	2.48	42.1
0	3E	287	<DL	9.86	119	3160	1.22	28.6
0	3F	626	<DL	11.8	88.1	5440	<DL	25.5
0	4A	93.3	8.83	2.94	1.72	425	<DL	<DL
0	4B	287	1.57	15.5	114	1730	1.65	16.1
0	4C	226	<DL	11.7	179	2030	3.24	41.2
0	4D	244	<DL	13.2	204	2010	3.41	38.9
0	4E	339	<DL	9.88	136	2990	1.33	29.7
0	4F	814	<DL	11.3	126	5660	1.28	41.3
0	5A	163	13.7	5.53	4.76	167	<DL	<DL
0	5B	402	2.72	18.9	60.2	1690	1.04	9.24
0	5C	215	<DL	11.9	186	1800	3.28	46.4
0	5D	248	<DL	14	211	2080	3.75	42.5
0	5E	332	<DL	9.83	128	3150	1.22	25.6
0	5F	659	<DL	10.8	130	6460	1.25	42.3
0	6A	1110	4.54	10.6	41.8	721	<DL	3.85
0	6B	350	2.32	18.4	68.5	1770	1.13	11.7
0	6C	201	<DL	12.2	183	1850	3.11	38.3
0	6D	517	<DL	17.3	221	2480	4.95	51.7
0	6E	347	<DL	9.69	149	3310	1.41	29.1
0	6F	787	<DL	10.7	147	7670	1.52	43.6
0	BCAL	28.5	<DL	<DL	3.85	269	<DL	<DL
0	BDOL	27	<DL	<DL	<DL	205	<DL	<DL
0	R1	<DL	<DL	<DL	<DL	57	<DL	<DL
4	1A	1050	56.7	249	19.4	2340	<DL	2.93

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
		Element, Unit, Detection Limit						
4	1B	1060	5.17	41.8	63.9	1790	1.31	11.4
4	1C	272	<DL	10.9	171	1770	2.54	32.9
4	1D	276	<DL	15.4	189	1860	2.66	30.5
4	1E	328	<DL	8.44	146	3650	1.4	32.7
4	1F	803	<DL	11	141	4610	1.44	47.5
4	2A	1000	42.2	14.7	23.4	4060	1.07	6.73
4	2B	1320	5.36	30.1	112	3440	2.34	17.9
4	2C	294	1.65	12.7	201	1870	3.04	41.8
4	2D	282	1.1	13.6	198	1840	2.97	37.6
4	2E	316	<DL	8.62	132	2670	1.11	31.9
4	2F	530	<DL	11.1	96.4	3410	0.845	26.3
4	3A	623	36.4	13.1	11.7	5620	<DL	2.72
4	3B	584	2.12	20.7	122	1860	1.77	17.8
4	3C	266	<DL	11.9	192	1880	3.13	43.9
4	3D	232	1.76	15.1	187	2140	2.49	34.6
4	3E	231	<DL	9.08	136	3310	1.34	31.7
4	3F	433	<DL	12.4	79.3	4260	<DL	21.7
4	4A	547	15.1	6	6.32	573	<DL	<DL
4	4B	302	1.1	15.9	122	1860	1.67	17.5
4	4C	246	<DL	11.4	206	1980	3.58	47.4
4	4D	207	<DL	15.2	209	1940	3.48	40.5
4	4E	328	<DL	9.55	141	2820	1.44	39.6
4	4F	587	<DL	12.2	101	4100	0.943	29.9
4	5A	605	16.3	16.8	40.8	48400	<DL	4.96
4	5B	460	2.38	19.3	80.2	3720	1.3	11.2
4	5C	207	<DL	11.5	190	1900	3.48	53.2
4	5D	189	<DL	13.8	210	1930	3.61	43.1
4	5E	320	<DL	8.88	133	3010	1.28	30.5
4	5F	484	<DL	11.5	101	4480	0.944	30.2
4	6A	334	17.1	8.82	12.3	6730	<DL	1.22
4	6B	418	1.79	19.8	89.5	2030	1.38	14.4
4	6C	202	<DL	11	200	1960	3.37	41.8
4	6D	253	<DL	13.3	215	2060	3.81	45.9
4	6E	337	<DL	8.71	152	3140	1.43	34.2
4	6F	536	<DL	11.2	106	4740	1.02	30.8
4	BCAL	80.1	<DL	2.35	3.53	25600	<DL	<DL
4	BDOL	15.1	<DL	3.1	34.3	11800	<DL	<DL
4	R3	<DL	<DL	1.36	<DL	394	<DL	<DL
7	1A	591	42.5	12.5	10.5	816	<DL	2.82
7	1B	1130	5.84	26.8	63.4	1850	1.4	11.4
7	1C	266	1.47	11.2	171	1780	1.99	34.4

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
7	1D	305	1.26	13.1	204	1880	2.9	36.1
7	1E	280	<DL	8.55	142	3170	1.31	34
7	1F	620	<DL	9.59	109	3610	1.15	38.8
7	2A	436	27.8	5.57	12.7	2020	<DL	4.89
7	2B	1200	5.71	27	95.4	3230	2.19	17.5
7	2C	297	2.18	12.8	214	1900	3.13	47.4
7	2D	348	2	12.2	218	1900	3.51	51.2
7	2E	243	<DL	8.61	121	2360	<DL	33.4
7	2F	622	<DL	12.8	107	3470	0.999	31
7	3A	689	37.6	13.3	23	4750	0.812	5.32
7	3B	616	2.4	21.3	159	1900	2.28	24
7	3C	183	1.44	12.6	163	1880	1.32	36.9
7	3D	282	2.18	15.5	238	2210	3.5	46.7
7	3E	573	<DL	9.71	153	3410	1.51	42.8
7	3F	388	<DL	10.9	74.6	3610	<DL	22.6
7	4A	306	11.9	5.18	6.81	486	<DL	<DL
7	4B	298	1.44	16.5	114	1690	1.55	17.5
7	4C	191	1.18	11.4	189	1830	2.63	47.4
7	4D	220	<DL	12.3	209	1870	3.52	48.8
7	4E	276	<DL	9.38	132	2600	0.878	42.6
7	4F	510	<DL	11.3	92.4	3560	0.897	28.3
7	5A	256	11.5	8.58	20.3	26300	<DL	3.54
7	5B	503	2.99	17	71.8	3860	1.15	9.61
7	5C	203	1.26	12.1	203	1890	3.48	54.9
7	5D	241	<DL	13.4	229	1940	4	55.4
7	5E	313	<DL	9.12	131	2800	1.06	34.5
7	5F	396	<DL	11.2	80.4	3690	<DL	25.8
7	6A	81	6.7	4.84	11.2	5420	<DL	0.911
7	6B	515	2.19	22.3	96.6	1980	1.48	15.6
7	6C	237	<DL	11.4	196	1940	3.23	44.2
7	6D	302	1.76	12.4	97.2	1910	4.46	63
7	6E	316	<DL	9.12	134	2700	1.13	34.5
7	6F	465	<DL	10.9	88.5	3820	0.893	28.2
7	BCAL	33.5	<DL	3.2	2.47	22100	<DL	<DL
7	BDOL	<DL	<DL	2.61	35	10200	<DL	<DL
7	R4	<DL	<DL	<DL	<DL	256	<DL	<DL
11	1A	708	51	15.1	11.8	1030	<DL	3.49
11	1B	1200	5.92	29.7	74.1	2080	1.42	11.5
11	1C	293	1.32	12.6	167	2030	1.78	31.8
11	1D	283	1.07	17.2	198	1970	2.76	33.3
11	1E	268	<DL	9.86	136	3000	1.32	35.7
11	1F	512	<DL	10.9	100	3190	1.01	33.1

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
		Element, Unit, Detection Limit						
11	2A	565	35.7	8.26	16.7	2240	<DL	6.08
11	2B	1250	6.75	24.4	64.1	2350	1.6	12.3
11	2C	328	2.46	14.5	238	1990	2.92	49.2
11	2D	643	2.03	18.4	302	1990	4.73	61.8
11	2E	221	<DL	9.34	121	2330	<DL	35.5
11	2F	402	<DL	11.3	95.1	2840	0.853	27
11	3A	1040	42.6	15.1	28	6130	1.34	10.3
11	3B	700	2.65	21.1	157	1930	2.15	21.7
11	3C	199	1.71	13	161	1920	1.21	34.4
11	3D	315	2.83	19.7	272	2680	3.92	54.2
11	3E	297	<DL	9.71	137	2680	1.02	48
11	3F	370	<DL	11.3	86.4	3520	<DL	25
11	4A	313	12.5	8.67	7.43	749	<DL	<DL
11	4B	294	1.33	17.2	121	1710	1.55	16.6
11	4C	186	1.13	12.2	186	2040	2.39	41.5
11	4D	203	<DL	16.6	243	2020	3.96	51.5
11	4E	240	<DL	9.91	125	2520	<DL	45.4
11	4F	389	<DL	11.6	82.8	3140	<DL	24.8
11	5A	193	20.5	20.1	40.8	39200	<DL	9.35
11	5B	629	3.55	17.8	67.2	3720	1.05	8.91
11	5C	152	1.18	12.9	182	1930	1.84	40.4
11	5D	199	<DL	15.5	244	2020	3.89	51.6
11	5E	266	<DL	9.56	126	2650	0.863	37.6
11	5F	383	<DL	11.6	85.7	3360	0.876	27
11	6A	234	11.2	5.03	12.1	4270	<DL	2.38
11	6B	533	2.35	23.8	98.4	2020	1.51	14.9
11	6C	194	1.13	12.2	200	1970	2.74	41
11	6D	379	1.97	13.1	234	2020	4.11	58
11	6E	259	<DL	9.58	129	2730	0.881	36.2
11	6F	414	<DL	11.4	88.9	3690	0.866	27.3
11	BCAL	39.3	<DL	2.78	2.4	20500	<DL	<DL
11	BDOL	<DL	<DL	2.37	18.4	7510	<DL	<DL
11	R5	<DL	<DL	<DL	<DL	333	<DL	<DL
14	1A	506	43.8	11.4	8.94	505	<DL	3.12
14	1B	1520	7.83	30.5	81.1	1690	1.9	12.9
14	1C	262	1.09	12.8	170	1580	1.9	28
14	1D	238	<DL	12.7	159	1590	2.22	23.3
14	1E	222	<DL	8.7	126	2590	0.971	31.2
14	1F	592	<DL	9.33	93.6	2810	1.03	27.3
14	2A	712	44.8	8.26	15.6	1670	0.858	6.69
14	2B	1620	12	22	48.3	1750	1.28	9.5
14	2C	402	2.11	14.5	252	1830	2.78	44

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
14	2D	412	1.52	13.1	239	1720	3.52	39.1
14	2E	217	<DL	8.77	118	2060	<DL	31.7
14	2F	385	<DL	9.47	95.6	2420	0.879	23.6
14	3A	1130	52.8	14.3	26.7	2610	1.31	8.19
14	3B	812	2.75	17.2	117	1730	1.47	12.8
14	3C	211	1.42	13.3	166	1770	1.22	28.1
14	3D	244	2.57	14.1	206	1780	2.59	35
14	3E	276	<DL	8.99	132	2330	<DL	43.7
14	3F	324	<DL	9.94	79.2	3410	<DL	19.8
14	4A	215	12.2	5.33	5.59	278	<DL	1.22
14	4B	324	1.13	17.3	123	1510	1.48	14.4
14	4C	191	<DL	12.4	185	1800	2.36	33
14	4D	208	<DL	13.7	205	1880	3.29	35.6
14	4E	200	<DL	9.09	118	2270	<DL	39.5
14	4F	381	<DL	9.51	82.4	2810	<DL	21.5
14	5A	117	9.46	4.35	12.8	18300	<DL	2.85
14	5B	962	4.81	16.6	55.5	2730	0.962	7.57
14	5C	161	<DL	11.6	180	1770	1.73	32.5
14	5D	196	<DL	12.9	222	1830	3.34	38.5
14	5E	258	<DL	8.94	128	2530	0.899	36.3
14	5F	367	<DL	9.95	84.4	3080	0.876	23.7
14	6A	216	10.3	5.59	8.73	2330	<DL	2.84
14	6B	591	2.33	24.3	101	1810	1.47	13.9
14	6C	205	<DL	12	197	1860	2.53	33.3
14	6D	612	1.87	12	242	1940	3.87	49.3
14	6E	254	<DL	9.07	125	2460	0.824	33.6
14	6F	364	<DL	9.9	87.4	3100	0.842	22.9
14	BCAL	60.9	<DL	2.62	2.29	19900	<DL	<DL
14	BDOL	<DL	<DL	2.31	31.6	7600	<DL	<DL
14	R6	<DL	<DL	<DL	<DL	30	<DL	<DL
18	1A	310	35	6.65	5.05	385	<DL	2.03
18	1B	2120	9.61	36.9	105	2240	1.91	14.4
18	1C	277	<DL	13.5	182	1590	1.67	25.6
18	1D	227	<DL	13.4	177	1650	2.28	22.4
18	1E	214	<DL	8.81	129	2660	<DL	32.8
18	1F	456	<DL	9.4	92.7	2630	0.912	24.4
18	2A	1130	48.1	14.1	26.4	2000	1.48	10.1
18	2B	1700	15.8	21.2	44.7	1780	1.17	8.78
18	2C	467	1.62	14.8	267	1860	2.42	40.2
18	2D	364	1.15	13.8	247	1730	3.29	35
18	2E	179	<DL	8.91	119	2020	<DL	32.4
18	2F	379	<DL	10	103	2640	0.935	25.4

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
		Element, Unit, Detection Limit						
18	3A	675	35.8	10.8	16.8	1980	<DL	5.36
18	3B	886	3.26	15.8	95	1410	1.21	9.88
18	3C	205	1.29	13.6	173	1670	1.29	27.2
18	3D	<DL	<DL	<DL	<DL	<DL	<DL	<DL
18	3E	253	<DL	9.33	131	2310	<DL	45.3
18	3F	283	<DL	10.3	90.3	3830	<DL	22
18	4A	120	13.6	3.26	2.41	212	<DL	0.836
18	4B	388	1.24	20.2	147	1770	1.74	16.6
18	4C	180	<DL	12.5	188	1790	2.3	31.4
18	4D	212	<DL	16	60.7	1870	3.13	32.2
18	4E	208	<DL	10.3	118	2150	<DL	41.1
18	4F	121	<DL	5.91	34.6	1830	<DL	9.77
18	5A	61.1	11.8	10.6	14.7	24100	<DL	3.87
18	5B	1140	5.6	16.7	48.5	2640	<DL	6.38
18	5C	169	<DL	12.6	184	1640	1.58	29.8
18	5D	102	<DL	9.35	94.3	947	1.81	19.9
18	5E	246	<DL	9.43	128	2420	0.878	36.3
18	5F	363	<DL	10.3	89.9	2970	0.865	24.4
18	6A	175	13.4	10.2	34.2	4420	<DL	8.53
18	6B	762	2.96	24.4	112	1720	1.59	14.4
18	6C	167	<DL	12.8	213	1820	2.49	33.9
18	6D	533	<DL	7.95	98.1	1160	1.96	25.6
18	6E	248	<DL	9.45	127	2380	0.802	34.3
18	6F	128	<DL	6.8	46.1	1860	<DL	13
18	BCAL	42.2	<DL	1.26	1.76	22900	<DL	<DL
18	BDOL	<DL	<DL	1.03	25	8990	<DL	<DL
18	R1	<DL	<DL	<DL	<DL	190	<DL	<DL
21	1A	298	30.8	6.95	6.13	449	<DL	2.13
21	1B	2360	9.61	34.4	90.5	1930	1.76	13.2
21	1C	289	1.29	13.9	176	1550	1.61	24
21	1D	203	<DL	12.7	164	1750	2.03	20.6
21	1E	238	<DL	8.54	118	2400	<DL	32.8
21	1F	440	<DL	9.11	96.4	2730	0.943	25.7
21	2A	694	29.9	8.95	17.9	1820	0.988	6.89
21	2B	1870	19.5	20.1	45.6	1780	1.27	9.53
21	2C	558	1.55	14.2	282	1800	2.28	38
21	2D	310	1.21	16.8	202	1820	2.65	27.1
21	2E	243	<DL	8.87	119	2110	<DL	34.5
21	2F	375	<DL	9.85	107	2850	1.06	28.2
21	3A	1210	42.3	18.2	37	3030	1.69	10.5
21	3B	874	3.02	14.4	71.8	1200	0.997	8.01
21	3C	183	1.23	13.6	174	1670	1.3	25.9

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
21	3D	263	5.87	17.4	224	1930	2.67	35.2
21	3E	268	1.29	9.35	132	2310	<DL	47.9
21	3F	287	<DL	10	90.7	3730	<DL	23
21	4A	230	15.3	5.94	7.18	590	<DL	1.91
21	4B	544	1.89	19.5	147	1840	1.66	15.5
21	4C	189	<DL	12.6	196	1810	2.37	30.6
21	4D	194	<DL	12.7	209	1890	2.83	29.7
21	4E	219	<DL	9.03	110	2030	<DL	41.1
21	4F	345	<DL	9.93	84.8	2790	<DL	21.3
21	5A	185	13.7	3.81	14.8	12500	<DL	5.14
21	5B	1410	5.8	16.9	52.8	2750	0.883	7.1
21	5C	166	<DL	11.9	175	1720	1.45	27
21	5D	207	<DL	12.7	222	1800	2.83	31.1
21	5E	268	<DL	8.9	129	2570	0.904	40.7
21	5F	351	<DL	10	95.8	3270	0.909	25.9
21	6A	357	17.6	5.47	14.5	2810	<DL	4.07
21	6B	1020	3.89	22.3	103	1800	1.47	13.1
21	6C	254	<DL	12.4	221	1990	2.5	32.4
21	6D	1010	1.73	12.2	241	1810	2.43	41.3
21	6E	244	<DL	9.25	120	2480	<DL	34.6
21	6F	340	<DL	10.8	88.2	3670	0.824	23
21	BCAL	33.2	<DL	2.21	1.68	16800	<DL	<DL
21	BDOL	<DL	<DL	2.28	39.4	8010	<DL	<DL
21	R2	<DL	<DL	<DL	2.03	769	<DL	<DL
25	1A	249	27.5	7.35	10.7	944	<DL	3.14
25	1B	2200	8.69	36.4	93	2070	1.89	13.2
25	1C	265	1.23	15.7	180	1630	1.62	21.4
25	1D	182	<DL	15.6	177	1680	2.03	19.5
25	1E	211	<DL	9.99	120	2330	<DL	32.9
25	1F	379	<DL	10.6	95.2	2710	0.959	25.1
25	2A	650	28.4	11.1	22	2260	1.02	6.65
25	2B	1850	18.2	22	52	1960	1.6	10.1
25	2C	537	1.16	15.3	260	1770	1.92	31.1
25	2D	36.8	<DL	6.18	37.8	905	<DL	5.39
25	2E	216	1.05	9.63	121	2050	<DL	33.8
25	2F	341	<DL	10.5	111	2650	1.07	30.2
25	3A	559	31.5	9.61	20.6	1860	0.874	6.3
25	3B	764	2.54	13.7	77	1520	1.08	8.88
25	3C	186	1.21	13.9	171	1670	1.39	24.8
25	3D	187	5.48	13.2	179	1900	2.17	27.2
25	3E	256	1.43	9.72	132	2170	<DL	47
25	3F	271	<DL	10.9	98.1	3620	0.842	24.5

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
25	4A	191	12.1	6.06	10.2	961	<DL	2.84
25	4B	655	2.03	19.4	140	1770	1.61	14.6
25	4C	196	<DL	14	215	1900	2.51	30.2
25	4D	187	<DL	13.6	222	1920	2.97	30.4
25	4E	224	<DL	10.1	114	2450	<DL	42
25	4F	344	<DL	11	92.8	3000	0.88	23
25	5A	169	15.8	4.02	11	10800	<DL	4.52
25	5B	1520	5.97	20.1	69.9	3240	1.11	8.85
25	5C	183	1.08	12.9	183	1830	1.5	26.6
25	5D	192	<DL	13.6	226	1750	2.65	29.9
25	5E	275	<DL	9.91	131	2610	0.876	41
25	5F	328	<DL	11	99.1	3110	0.946	27.1
25	6A	732	12.7	7.95	30.9	3220	<DL	4.9
25	6B	1170	4.05	23	104	1900	1.41	12.7
25	6C	258	<DL	14.2	226	1990	2.52	30.7
25	6D	1240	1.9	13.4	228	1770	2.12	33.2
25	6E	269	<DL	10.5	122	2920	0.825	35.5
25	6F	332	<DL	11	99.9	2940	0.968	24.6
25	BCAL	24.8	<DL	1.95	2.14	13100	<DL	<DL
25	BDOL	<DL	<DL	2.49	24.1	5380	<DL	<DL
25	R3	<DL	<DL	<DL	<DL	293	<DL	<DL
28	1A	256	25.3	<DL	15.2	712	1.01	4.43
28	1B	1770	7.93	<DL	92.7	2110	1.81	12.3
28	1C	268	1.15	<DL	180	806	1.69	19.5
28	1D	219	<DL	<DL	185	1010	2.06	19.2
28	1E	225	<DL	<DL	112	2170	<DL	30.5
28	1F	362	<DL	<DL	96.4	2320	0.885	24.8
28	2A	436	24.9	<DL	10.2	1410	<DL	3.88
28	2B	1520	16.3	<DL	47.6	1890	1.32	8.81
28	2C	500	1.16	<DL	218	622	1.54	22.6
28	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
28	2E	229	<DL	<DL	114	1860	<DL	32.3
28	2F	361	<DL	<DL	114	2380	1.01	32.1
28	3A	446	27.8	<DL	17.6	1670	<DL	4.43
28	3B	663	2.18	<DL	87.1	1020	1.23	10
28	3C	188	<DL	<DL	154	635	1.28	19.6
28	3D	239	6.04	<DL	188	1310	2.27	27
28	3E	315	1.22	<DL	128	2020	<DL	43
28	3F	277	<DL	<DL	95.2	2840	0.866	24.3
28	4A	145	9.78	<DL	10.1	<DL	<DL	2.06
28	4B	656	2.07	<DL	126	825	1.48	12.3
28	4C	200	<DL	<DL	219	1030	2.43	28.2

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
28	4D	228	<DL	<DL	225	1200	2.81	27.8
28	4E	228	<DL	<DL	102	1930	<DL	37.3
28	4F	331	<DL	<DL	83.1	2280	<DL	20
28	5A	152	12.7	<DL	6.48	3350	<DL	2.91
28	5B	1450	5.88	<DL	64.2	2490	1.22	7.88
28	5C	215	<DL	<DL	191	972	1.56	24.2
28	5D	218	<DL	<DL	196	537	2.13	24
28	5E	275	<DL	<DL	129	2140	<DL	38.2
28	5F	369	<DL	<DL	101	2850	0.999	28.4
28	6A	475	7.18	<DL	25.5	2100	<DL	4.98
28	6B	1100	4.06	<DL	104	1770	1.46	12
28	6C	266	<DL	<DL	228	1130	2.32	27.6
28	6D	1140	1.63	<DL	50.8	653	2.29	27.1
28	6E	267	<DL	<DL	107	2120	<DL	32.2
28	6F	380	<DL	<DL	87.5	2110	0.801	21.2
28	BCAL	58.7	<DL	<DL	1.62	14700	<DL	<DL
28	BDOL	30.9	<DL	<DL	33.1	5750	<DL	<DL
28	R4	27.6	<DL	<DL	<DL	<DL	<DL	<DL
32	1A	313	24.1	<DL	40.9	2040	2.41	11.2
32	1B	1460	6.8	<DL	104	2170	2.04	14
32	1C	271	1.18	<DL	196	776	1.78	20.3
32	1D	193	1.01	<DL	201	1020	2.04	19.8
32	1E	226	<DL	<DL	99	1950	<DL	28
32	1F	358	<DL	<DL	95.3	2110	0.834	24.3
32	2A	423	25.7	<DL	18.9	2290	<DL	5.27
32	2B	1480	16.1	<DL	49.8	2060	1.39	9.2
32	2C	456	1.21	<DL	192	475	1.31	18.9
32	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
32	2E	257	1.14	<DL	115	1910	<DL	32.4
32	2F	366	<DL	<DL	122	2290	1.06	36.8
32	3A	351	24.8	<DL	23.2	2000	0.861	5.58
32	3B	638	2.05	<DL	117	2000	1.84	14.9
32	3C	194	1.07	<DL	174	807	1.51	20.5
32	3D	204	5.21	<DL	188	1080	2.05	25.4
32	3E	344	1.74	<DL	124	2030	<DL	42
32	3F	270	<DL	<DL	94.6	2640	<DL	24.7
32	4A	167	10.5	<DL	17.6	794	0.92	4.36
32	4B	625	2.23	<DL	131	1030	1.54	12.9
32	4C	205	<DL	<DL	211	1020	2.31	25.2
32	4D	224	<DL	<DL	217	1250	2.6	25.8
32	4E	239	1.22	<DL	102	1980	<DL	37.3
32	4F	322	<DL	<DL	85.7	2300	0.8	20.8

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
32	5A	194	8.98	<DL	2.95	2350	<DL	1.66
32	5B	1320	5.35	<DL	72.4	2780	1.15	8.82
32	5C	198	1.23	<DL	171	857	1.44	20.3
32	5D	238	<DL	<DL	207	768	2.14	23.2
32	5E	300	<DL	<DL	126	2270	0.808	40.1
32	5F	349	<DL	<DL	94	2550	0.882	26.7
32	6A	422	3.87	<DL	64.5	3120	<DL	8.34
32	6B	925	3.31	<DL	170	2550	2.19	18.9
32	6C	268	1.02	<DL	223	1220	2.28	25.3
32	6D	1160	1.76	<DL	180	612	1.44	23.5
32	6E	289	1.02	<DL	110	2140	<DL	32.3
32	6F	349	1.05	<DL	95	2290	0.835	22.5
32	BCAL	53.6	<DL	<DL	1.78	13500	<DL	<DL
32	BDOL	29.6	<DL	<DL	23.8	4620	<DL	<DL
32	R5	28.7	<DL	<DL	<DL	<DL	<DL	<DL
35	1A	236	19.9	7.73	45.3	2610	2.89	13.2
35	1B	1310	5.07	23.4	135	3050	2.88	18.5
35	1C	210	<DL	16.6	201	1270	1.83	20
35	1D	207	<DL	13.3	232	1510	2.4	22.9
35	1E	164	<DL	8.12	106	2410	<DL	30.5
35	1F	339	<DL	9.21	108	2640	0.977	29.3
35	2A	271	19.4	5.56	14.5	2800	<DL	4.63
35	2B	1280	12	17.5	59.1	2650	1.76	11
35	2C	373	<DL	13.2	188	775	1.36	17.6
35	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
35	2E	212	<DL	8.92	121	2320	<DL	35.2
35	2F	374	<DL	9.9	138	2710	1.22	45.2
35	3A	209	17.5	6.87	21	2380	1.05	6.06
35	3B	611	1.22	12.8	130	2610	2.26	17.8
35	3C	154	<DL	14	201	1460	1.98	23.8
35	3D	160	7.58	12.4	219	1520	2.22	29.1
35	3E	566	1.36	10.8	154	2710	1.1	51
35	3F	235	<DL	10.6	99.6	3040	0.835	28.4
35	4A	93.6	6.04	3.53	15.7	930	0.89	4.2
35	4B	579	1.09	14.9	150	1800	1.95	15.6
35	4C	151	<DL	14.4	243	1620	2.62	28.9
35	4D	202	<DL	13.4	267	1840	3.11	31.9
35	4E	185	<DL	9.2	100	2260	<DL	37.8
35	4F	310	<DL	10.7	98.8	2780	0.917	25.2
35	5A	86.2	7.1	1.95	3.81	3150	<DL	1.53
35	5B	1200	3.97	16.7	92.1	3610	1.48	11.5
35	5C	142	<DL	13	191	1360	1.68	21.8

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
		Element, Unit, Detection Limit						
35	5D	217	<DL	13.4	232	1140	2.37	25.5
35	5E	260	<DL	8.96	126	2640	0.821	32.2
35	5F	277	<DL	9.77	93.4	3110	0.941	22.1
35	6A	181	1.21	4.19	71.9	3050	0.924	7.65
35	6B	776	1.73	17.4	170	3810	2.3	14.8
35	6C	276	<DL	13.2	310	2450	3.23	26.5
35	6D	1030	<DL	13.3	196	1330	1.51	17.2
35	6E	227	<DL	8.51	114	2670	<DL	27.2
35	6F	278	<DL	8.5	95.3	2920	0.869	18.5
35	BCAL	42.2	<DL	<DL	2.18	13400	<DL	<DL
35	BDOL	7.26	<DL	<DL	24.6	4930	<DL	<DL
35	R6	<DL	<DL	<DL	<DL	105	<DL	<DL
39	1A	295	14.9	7.4	64.1	4550	4.27	14.4
39	1B	1240	3.32	21.9	178	4920	4.02	18.1
39	1C	206	<DL	15.4	210	1880	1.89	15.2
39	1D	168	<DL	15.2	238	2050	2.4	17.2
39	1E	183	<DL	8.65	105	2480	<DL	23
39	1F	281	<DL	8.4	103	2630	0.956	21.8
39	2A	280	14.2	6.74	39	4980	1.96	7.75
39	2B	1070	7.12	15.9	71.6	3830	2.36	10
39	2C	307	<DL	11.9	170	1130	1.25	11.2
39	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
39	2E	205	<DL	7.9	114	2450	<DL	25.1
39	2F	304	<DL	7.8	137	2790	1.19	34.4
39	3A	219	11.6	4.1	46.4	4550	2.53	9.33
39	3B	592	<DL	9.74	141	3280	2.67	15
39	3C	134	<DL	10.6	204	1970	2.14	17.4
39	3D	157	2.94	10.7	262	2300	2.81	25.6
39	3E	319	1.08	7.63	147	2590	1.03	36.1
39	3F	196	<DL	7.85	100	3250	0.859	21.6
39	4A	144	4.39	2.29	28.9	2440	1.75	5.97
39	4B	609	<DL	12.8	216	2640	3.07	17.1
39	4C	154	<DL	12.1	259	2240	2.81	23.1
39	4D	197	<DL	11	280	2390	3.22	25.1
39	4E	194	<DL	7.08	103	2520	<DL	29.3
39	4F	253	<DL	7.91	90.5	2710	0.832	16.9
39	5A	45.8	3.94	<DL	3.43	4020	<DL	<DL
39	5B	902	2.26	14.6	135	5440	2.08	11.6
39	5C	121	<DL	11.1	207	2100	1.81	16.6
39	5D	206	<DL	11	229	1640	2.3	18.2
39	5E	263	<DL	6.65	126	2650	<DL	31.2
39	5F	259	<DL	7.43	95.2	2790	0.893	21.4

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
39	6A	285	2.54	3.08	69.1	5550	1.36	7.35
39	6B	713	1.46	15.4	203	4760	3.02	18.2
39	6C	298	<DL	12.6	343	2440	3.9	27.8
39	6D	771	<DL	12.2	193	1420	1.56	15.5
39	6E	209	<DL	6.69	106	2500	<DL	23.2
39	6F	278	<DL	7.77	104	2860	0.932	18.8
39	BCAL	13.5	<DL	<DL	2.43	13600	<DL	<DL
39	BDOL	<DL	<DL	<DL	21.3	5110	<DL	<DL
39	R1	<DL	<DL	<DL	<DL	156	<DL	<DL
42	1A	199	5.18	6.94	41.5	2070	2.79	12.6
42	1B	1290	3.57	27	215	4030	5.23	30
42	1C	253	<DL	17.3	275	1610	2.47	26.4
42	1D	244	<DL	12.7	309	1740	3.13	29.4
42	1E	224	<DL	7.32	126	2070	<DL	36.6
42	1F	340	<DL	7.69	128	2140	1.15	37.3
42	2A	250	16.3	4.02	47.4	3980	2.61	13.5
42	2B	1090	8.47	15.8	98.3	3680	3.45	19.1
42	2C	342	<DL	12.2	209	906	1.64	18
42	2D	545	<DL	17.7	295	1730	3.08	33.5
42	2E	249	<DL	7.1	135	1950	<DL	40.3
42	2F	407	<DL	8.26	173	2180	1.45	58.5
42	3A	268	16.9	3.56	58.4	3790	3.29	16.8
42	3B	690	1.49	8.96	149	2550	3.13	23.1
42	3C	172	<DL	10.7	253	1630	2.75	29.3
42	3D	228	5.67	11	327	1550	3.42	38.3
42	3E	442	1.72	8.08	179	2120	1.1	60.4
42	3F	197	<DL	8.51	123	2930	1.03	36.4
42	4A	122	7.34	<DL	16.3	1130	1.06	4.92
42	4B	848	1.17	13.2	294	2730	4.82	33.6
42	4C	250	<DL	12.1	353	2030	3.95	43.4
42	4D	295	<DL	11.1	358	2020	4.21	43.5
42	4E	222	<DL	6.73	113	1990	<DL	44.5
42	4F	303	<DL	7.8	115	2260	1.08	29.1
42	5A	858	4.23	<DL	3.46	2500	<DL	0.889
42	5B	972	2.8	15.3	195	5520	3.67	26.2
42	5C	165	<DL	11.5	256	1640	2.31	26.1
42	5D	254	<DL	11.6	337	1330	2.84	30
42	5E	317	<DL	6.47	150	2120	0.907	50.6
42	5F	316	<DL	7.06	119	2290	1.08	36.2
42	6A	265	4.62	3.17	36.5	2780	1.01	7.53
42	6B	897	1.73	19.1	318	5460	5.2	41
42	6C	377	<DL	14.4	455	2150	5.31	51.4

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
42	6D	827	<DL	13.2	266	1030	2.1	22
42	6E	281	<DL	6.88	136	2140	0.873	41.9
42	6F	314	<DL	7.7	121	2300	1.06	29.9
42	BCAL	36.8	<DL	<DL	3.59	11100	<DL	<DL
42	BDOL	18.1	<DL	<DL	27.6	4090	<DL	<DL
42	R2	15.6	<DL	<DL	<DL	96.3	<DL	<DL
47	1A	520	17.1	7.7	125.75	6525	8.8	39.25
47	1B	1580	3.29	19	266	5270	7.2	39.1
47	1C	209	<DL	14.5	257	1750	2.36	25
47	1D	1390	<DL	11	307	1780	3.14	29.6
47	1E	234	<DL	6	133	2090	<DL	36.4
47	1F	324	<DL	6.04	142	2140	1.2	39.5
47	2A	318	13.6	3.65	109	9240	5.93	28.8
47	2B	1170	6.53	15.5	159	7100	5.83	31.5
47	2C	299	<DL	10.4	212	1090	1.68	17.1
47	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
47	2E	253	<DL	6.33	142	2100	<DL	37.7
47	2F	435	<DL	6.82	201	2230	1.55	62.4
47	3A	161	13.3	1.02	30.5	3240	1.46	10.2
47	3B	859	1.44	8.16	183	3300	4.19	28.7
47	3C	161	<DL	8.87	251	1730	2.87	28.8
47	3D	353	3.51	10.3	346	1800	3.82	42.2
47	3E	619	1.35	6.23	222	2140	1.68	63.9
47	3F	192	<DL	7.01	130	3000	0.935	33.5
47	4A	126	5.82	<DL	19.8	1500	1.28	5.59
47	4B	1320	1.01	10.6	355	3790	6.69	43
47	4C	263	<DL	10.5	366	2090	4.21	44.8
47	4D	343	<DL	12.3	371	2070	4.62	46.4
47	4E	226	<DL	6.97	116	1990	<DL	42.5
47	4F	301	<DL	7.66	120	2220	1.02	27.5
47	5A	59.4	4.19	<DL	5.83	5580	<DL	1.01
47	5B	1350	2.47	17.1	363	9960	7.9	52.1
47	5C	154	<DL	9.41	258	1660	2.3	24.1
47	5D	259	<DL	10.2	320	1670	3.17	33.4
47	5E	339	<DL	5.87	152	2210	0.93	47.8
47	5F	337	<DL	6.73	141	2660	1.26	40.2
47	6A	322	4.53	<DL	45.9	3340	1.29	9.05
47	6B	1150	2.05	19.2	405	8070	8.18	59.9
47	6C	404	<DL	12.9	498	2420	5.95	54.5
47	6D	498	1.07	12.3	236	1080	1.94	20.1
47	6E	303	<DL	6.21	153	2210	0.927	42.2
47	6F	337	<DL	6.77	142	2390	1.14	31.6

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
47	BCAL	37	<DL	<DL	2.57	11500	<DL	<DL
47	BDOL	20.3	<DL	<DL	19.1	3880	<DL	<DL
47	R3	24.5	<DL	<DL	<DL	78.1	<DL	<DL
49	1A	190	9.97	6.11	38.3	2790	2.62	11.6
49	1B	1570	3.29	20.2	215	6410	6.11	32.4
49	1C	242	<DL	18	290	2740	2.67	28.6
49	1D	278	<DL	14.9	348	2870	3.81	34.1
49	1E	217	<DL	9.51	130	2920	<DL	34.3
49	1F	321	<DL	9.42	140	2970	1.17	38.5
49	2A	243	12.6	5.25	85.6	10300	4.65	23
49	2B	1180	5.86	16.9	145	10000	5.54	29.3
49	2C	294	<DL	13.7	211	1510	1.78	17
49	2D	289	<DL	14.8	356	2360	3.49	35.8
49	2E	242	<DL	9.31	136	2740	<DL	35.9
49	2F	462	<DL	10.1	196	2970	1.42	58.1
49	3A	210	17	6.62	30.1	3510	1.63	8.99
49	3B	786	1.13	12.5	130	3770	3.26	21.4
49	3C	169	<DL	13.6	273	2830	3.3	32
49	3D	602	2.15	14.7	378	2610	4.33	43.1
49	3E	816	1.28	11.3	249	3050	1.64	63
49	3F	229	<DL	11.4	146	3700	1.1	35.7
49	4A	109	5.84	2.92	17.7	1560	1.05	4.63
49	4B	1360	<DL	13.9	296	4920	6.13	37
49	4C	297	<DL	14.2	368	3000	4.73	49.4
49	4D	382	<DL	13.4	362	3150	4.88	48.8
49	4E	220	<DL	9.43	143	2850	<DL	40.9
49	4F	268	<DL	9.99	118	3130	0.951	25.2
49	5A	53.4	6.32	1.21	6.11	8010	<DL	1.3
49	5B	1560	2.23	19.6	360	16100	9.19	56
49	5C	176	<DL	14.6	319	2920	2.89	28.9
49	5D	335	<DL	13.7	345	2500	3.6	35.8
49	5E	320	<DL	9.02	144	2960	0.836	43.2
49	5F	296	<DL	9.9	129	3280	1.15	34.7
49	6A	414	5.54	4.43	41.9	3870	1.02	7.7
49	6B	1120	1.68	19.4	336	10400	7.21	50.6
49	6C	472	<DL	15.6	512	3950	6.58	57.1
49	6D	583	<DL	16.6	276	1770	2.09	22.3
49	6E	294	1.08	10.2	140	3160	0.868	41
49	6F	323	<DL	10.6	138	3150	1.05	30.1
49	BCAL	6.42	<DL	1.12	2.91	14600	<DL	<DL
49	BDOL	<DL	<DL	1.4	26.7	5840	<DL	<DL
49	R4	<DL	<DL	<DL	<DL	96.5	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
		Element, Unit, Detection Limit						
53	1A	220	24.4	4.83	36.9	2790	2.49	10.9
53	1B	1560	3.47	20	190	6460	5.98	30.5
53	1C	238	<DL	17.8	287	2940	2.88	29.9
53	1D	316	<DL	16.8	332	2890	3.85	32.5
53	1E	209	<DL	10.9	134	2950	<DL	31.9
53	1F	341	<DL	10.9	154	3150	1.2	37.9
53	2A	254	14.9	6.92	89.5	10600	4.95	22.7
53	2B	1330	5.19	18.8	170	12800	6.88	35.6
53	2C	284	<DL	14.2	216	1910	1.91	17.7
53	2D	389	<DL	13.4	323	2080	2.97	29.6
53	2E	241	<DL	11.2	147	2740	<DL	36
53	2F	519	<DL	12.2	218	3000	1.52	55.5
53	3A	241	21.1	7.61	41.4	4160	2.23	11
53	3B	861	1.56	12.5	133	3780	3.46	22.3
53	3C	169	<DL	15.1	265	2920	3.46	31.9
53	3D	924	2.62	15.1	381	2640	4.77	41.8
53	3E	781.5	n.d.	14.115	246	3585	1.4175	58.95
53	3F	261	<DL	14.3	152	3670	1.05	31.8
53	4A	180	7.46	7.18	43.4	2840	2.23	9.78
53	4B	1940	1.03	17.7	328	5730	7.42	42.8
53	4C	322	<DL	17.8	372	3100	5.01	49.6
53	4D	442	<DL	18.4	380	3230	5.57	53.6
53	4E	219	<DL	13.1	118	2780	<DL	39.1
53	4F	278	<DL	14	133	2990	1.05	25
53	5A	50.6	7.45	4.32	13	13700	<DL	2.14
53	5B	2420	2.25	26.6	419	21400	12.9	75.3
53	5C	177	<DL	19.4	353	3230	3.33	32.6
53	5D	500	<DL	19.3	406	2980	4.91	46
53	5E	312	<DL	12.8	153	2910	0.863	41.8
53	5F	331	<DL	15.3	149	3250	1.18	35.2
53	6A	364	6.7	7.71	38.4	3850	0.993	6.78
53	6B	1280	1.98	25	332	10700	8.13	53.1
53	6C	545	<DL	20.5	518	4890	7.52	61.2
53	6D	502	<DL	21.1	257	1820	2.17	22.7
53	6E	287	<DL	13.8	146	2940	0.859	39.2
53	6F	309	<DL	14.6	167	2970	1.13	28.2
53	BCAL	<DL	<DL	3.89	2.93	14300	<DL	<DL
53	BDOL	<DL	<DL	3.82	18.3	4480	<DL	<DL
53	R5	<DL	<DL	2.59	<DL	114	<DL	<DL
56	1A	294	19	7	54.6	2910	3.63	15.6
56	1B	1590	2.96	19.1	208	6090	6.37	32.5
56	1C	252	<DL	17.7	319	2770	3.3	35.7

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
56	1D	403	<DL	14.2	377	2900	5.19	44.7
56	1E	235	<DL	9.1	155	2270	<DL	36.4
56	1F	365	<DL	10.1	196	2660	1.44	44.4
56	2A	256	14	5.81	84.7	9240	4.5	21.8
56	2B	1350	5.31	17.9	181	13000	7.22	37.7
56	2C	245	<DL	8.51	283	1460	2.61	23.8
56	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
56	2E	288	<DL	9.42	180	2280	<DL	41.5
56	2F	602	<DL	10.8	280	2780	1.83	68.3
56	3A	333	21.5	6.66	52.1	4300	2.48	12.9
56	3B	912	1.26	10.2	135	3540	3.59	23.3
56	3C	229	<DL	12.1	298	2340	4.13	38.2
56	3D	1300	1.6	13.8	423	2320	6.11	53
56	3E	745.5	n.d.	10.47	256.5	3315	1.4265	66.9
56	3F	254	<DL	11.3	182	3890	1.17	36
56	4A	178	6.69	3.97	43.1	2340	2.64	11.6
56	4B	2160	<DL	13.2	320	5680	7.91	45.7
56	4C	330	<DL	13.9	378	3320	5.84	59.5
56	4D	522	<DL	13.8	400	3480	6.59	62.8
56	4E	249	<DL	9.48	135	2260	<DL	44.1
56	4F	300	<DL	10.8	168	3110	1.25	28.8
56	5A	62.2	5.52	1.47	15.7	13300	<DL	1.94
56	5B	2820	1.98	21.3	465	24300	15.5	79.4
56	5C	259	<DL	15.1	392	3730	4.34	42.1
56	5D	638	<DL	14.6	498	3710	6.62	61.2
56	5E	386	<DL	9.31	189	2590	1.08	50.4
56	5F	319	<DL	10.5	172	3220	1.31	40.1
56	6A	426	6.27	5.62	53	3670	1.09	8.53
56	6B	1290	1.58	18.3	320	9950	8.14	53
56	6C	620	<DL	16.6	567	5600	8.8	70
56	6D	489	<DL	15.4	277	1900	2.43	26.2
56	6E	329	<DL	9.53	171	2500	0.991	46.5
56	6F	328	<DL	10.5	201	3040	1.34	35.5
56	BCAL	28.7	<DL	<DL	2.57	14500	<DL	<DL
56	BDOL	15.3	<DL	<DL	21.6	4670	<DL	<DL
56	R6	12.9	<DL	<DL	<DL	<DL	<DL	<DL
60	1A	267	15.6	6.26	51.1	3070	3.34	14.8
60	1B	1600	3.2	17.2	193	5980	6.06	31.1
60	1C	261	<DL	16.7	308	3230	3.49	36.8
60	1D	657	<DL	14	422	3540	6.39	53
60	1E	229	<DL	8.18	158	2290	<DL	36.1
60	1F	370	<DL	9.73	205	2680	1.43	42.2

Table 13: cont

Time (days)	Column # and port location	Al μg/L 0.6	As μg/L 1	B μg/L 1	Ba μg/L 0.8	Ca μg/L 10	Cd μg/L 0.8	Co μg/L 0.6
		Element, Unit, Detection Limit						
60	2A	250	14.5	4.67	76.4	8870	4.04	19.9
60	2B	1450	5.22	17.1	187	14400	7.42	38.7
60	2C	296	<DL	12.7	264	2260	2.78	25.4
60	2D	699	n.d.	17.4	490.5	3360	5.88	59.25
60	2E	298	<DL	8.86	185	2240	0.844	40.3
60	2F	652	<DL	10.2	282	2760	1.77	67.2
60	3A	270	21.2	4.6	40.3	3610	2.08	10.8
60	3B	1000	1.12	9.55	132	3590	3.67	23.9
60	3C	245	<DL	11.5	293	2560	4.61	41.2
60	3D	1720	2.85	11.8	364	2300	5.98	47.2
60	3E	913.5	n.d.	9.42	298.5	3345	1.3635	67.35
60	3F	337	<DL	10.7	209	3250	1.29	36.1
60	4A	233	8.3	4.28	58.9	3300	3.51	15.7
60	4B	2970	<DL	12.8	330	5880	8.79	49.7
60	4C	417	<DL	13.5	394	3980	6.76	66.8
60	4D	693	<DL	15	414	4020	7.44	68.6
60	4E	288	<DL	9.73	138	2290	<DL	44.3
60	4F	302	<DL	11.2	175	3040	1.23	27.3
60	5A	76.3	7.33	1.69	23.3	21600	<DL	2.94
60	5B	2960	1.8	20.4	439	24900	15.7	79
60	5C	353	<DL	15.1	447	5520	5.4	49.4
60	5D	977	<DL	14.9	566	5480	8.36	69.9
60	5E	426	<DL	8.78	206	2820	1.24	51.8
60	5F	343	<DL	10.2	203	3290	1.48	41.7
60	6A	422	4.54	3.83	51.2	4260	1.16	8.46
60	6B	1500	1.52	16	315	9750	8.73	53.8
60	6C	701	<DL	15.7	534	6630	9.39	72
60	6D	457	<DL	14.6	250	2010	2.37	25.7
60	6E	354	<DL	8.72	176	2610	1.06	46.3
60	6F	357	<DL	10.1	219	2980	1.37	35.1
60	BCAL	25.3	<DL	<DL	2.6	13700	<DL	<DL
60	BDOL	14.7	<DL	<DL	18.4	4250	<DL	<DL
60	R1	13	<DL	<DL	<DL	<DL	<DL	<DL
63	1A	271	19.4	6.6	49.2	2850	3.27	14
63	1B	1550	3.3	16.7	171	5540	5.49	27
63	1C	231	<DL	16.5	289	3600	3.48	36.4
63	1D	718	<DL	14.1	444	4480	6.84	54.7
63	1E	224	<DL	8.82	155	2420	<DL	33.3
63	1F	399	<DL	9.56	214	2850	1.4	39.5
63	2A	186	12.4	3.9	52.6	6770	2.81	13.3
63	2B	1440	5.47	17.2	184	15200	7.14	37
63	2C	299	<DL	13.1	264	3200	3.08	27.2

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
63	2D	794	2.36	10.7	381	7190	6.95	54.7
63	2E	326	<DL	8.86	198	2530	0.962	38.9
63	2F	793	<DL	10.3	305	3030	1.85	64
63	3A	235	17.1	5.64	37.7	3600	1.95	9.66
63	3B	1070	1.04	10.3	124	3660	3.51	21.8
63	3C	374	<DL	12.2	298	2970	5.15	41.4
63	3D	2070	1.99	12.3	348	2560	5.75	42.1
63	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
63	3F	290	<DL	10.6	211	4270	1.16	32.5
63	4A	212	8.2	4.56	50.3	2830	2.88	12.1
63	4B	3420	1.04	12.6	311	6130	8.43	44.9
63	4C	615	<DL	13.4	430	5350	8.26	70.7
63	4D	1050	<DL	12.6	450	5060	8.76	71
63	4E	348	<DL	9.12	149	2620	0.851	45.1
63	4F	349	<DL	10.2	201	3440	1.38	28.9
63	5A	66.5	7.16	1.57	18	18400	<DL	2.4
63	5B	2750	1.8	17.7	372	23000	13.3	70.7
63	5C	482	<DL	15	509	9270	6.83	58.7
63	5D	1360	<DL	14.4	610	7980	9.95	73.6
63	5E	531	<DL	8.84	212	3200	1.43	49.6
63	5F	391	<DL	10.5	222	3630	1.58	41
63	6A	413	6.91	4.86	73.9	3740	1.42	11.2
63	6B	1740	1.62	16.1	297	9860	8.53	49
63	6C	852	<DL	14.7	494	7070	9.56	68.4
63	6D	411	<DL	14.2	232	2480	2.5	25.5
63	6E	372	<DL	8.92	181	2820	1.09	44.2
63	6F	375	<DL	10.2	240	3460	1.42	34
63	BCAL	12.4	<DL	<DL	2.68	14600	<DL	<DL
63	BDOL	<DL	<DL	<DL	20.4	4860	<DL	<DL
63	R2	<DL	<DL	<DL	<DL	<DL	<DL	<DL
67	1A	158	13.3	3.27	34.9	2510	2.35	9.81
67	1B	1630	3.07	17	193	6200	5.98	29.4
67	1C	235	<DL	16.1	267	3720	3.4	34
67	1D	1040	<DL	15.5	453	5330	8.33	61.7
67	1E	243	<DL	9.37	164	2530	0.827	31.8
67	1F	387	<DL	10.3	223	2910	1.42	36.8
67	2A	192	13.3	4.89	58.3	7670	3.07	14.3
67	2B	1340	5.07	17.5	189	16100	7.15	36.4
67	2C	319	<DL	12.4	261	3680	3.32	28.9
67	2D	1340	1.04	13.4	540	6480	9.02	71.9
67	2E	351	<DL	9.09	213	2680	1.09	39.4
67	2F	775	<DL	10.4	307	2980	1.78	58.9

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
67	3A	213	17.7	4.01	38.5	3870	2.02	10.1
67	3B	1030	1.14	9.06	129	3720	3.45	21.2
67	3C	495	<DL	11.4	302	3620	5.92	44.6
67	3D	2920	2.09	12.9	367	2950	7.08	49.1
67	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
67	3F	299	<DL	10.7	213	4470	1.17	31.2
67	4A	256	8.58	4.72	61.8	3640	3.65	15.1
67	4B	3310	1.08	12.2	308	5870	8.12	41.8
67	4C	746	<DL	13.1	452	6070	9.61	73.7
67	4D	1590	<DL	13.4	528	7070	11.1	79.8
67	4E	446	<DL	8.68	161	2680	1.08	46.3
67	4F	345	<DL	10	235	3710	1.61	30.7
67	5A	63.8	7.1	1.59	17.1	19000	<DL	1.76
67	5B	2550	1.96	16.1	347	20600	12.2	63.8
67	5C	522	<DL	14.8	492	11600	7.28	59.6
67	5D	1660	<DL	15.1	620	10900	11.4	75.9
67	5E	658	<DL	9.48	226	3140	1.62	52.9
67	5F	481	<DL	11.2	267	3430	1.76	46.1
67	6A	606	2.23	5.38	111	3670	1.76	14.6
67	6B	2090	1.32	17	297	8890	8.66	50.4
67	6C	1500	<DL	15.3	579	8840	12.3	84.7
67	6D	470	<DL	14.8	221	2300	2.66	27.5
67	6E	464	<DL	9.09	184	2610	1.13	45.2
67	6F	464	<DL	10.8	274	2880	1.53	36.9
67	BCAL	48.4	<DL	<DL	3.39	14200	<DL	<DL
67	BDOL	3.87	<DL	<DL	18.3	4220	<DL	<DL
67	R3	2.55	<DL	<DL	<DL	<DL	<DL	<DL
70	1A	184	15.3	5.3	29.3	1690	1.97	8.2
70	1B	1870	2.91	19.7	200	4760	6.52	32.9
70	1C	286	<DL	17.1	265	2640	3.54	36
70	1D	1450	<DL	14.2	442	4040	9.11	68.2
70	1E	288	<DL	8.53	163	2130	0.848	31.5
70	1F	450	<DL	9.03	226	2190	1.36	35.7
70	2A	214	13.5	3.98	57	5140	2.91	13.5
70	2B	1260	5	16.6	165	10300	6.36	33.5
70	2C	372	<DL	12.2	256	3010	3.52	31.7
70	2D	1720	<DL	12.9	547	5110	9.85	79.4
70	2E	433	<DL	8.28	217	2170	1.1	39.1
70	2F	924	<DL	9.51	318	2300	1.83	59.2
70	3A	270	17.3	3.86	46.7	3080	2.27	11.3
70	3B	1030	1.02	7.7	104	2340	2.97	18.5
70	3C	951	<DL	10.2	293	2370	6.15	44.3

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
70	3D	3040	1.49	11.5	362	2320	6.52	46.4
70	3E	471	1.03	13.6	280	3460	2.03	48.9
70	3F	373	<DL	9.54	222	2970	1.23	32.3
70	4A	296	9.21	4.08	60.7	2440	3.34	14
70	4B	3040	<DL	11.1	254	3680	6.96	36.6
70	4C	988	<DL	12.1	445	4260	10.1	80
70	4D	2140	<DL	12.4	499	4770	11.7	86.5
70	4E	581	<DL	7.6	155	2250	1.11	45.4
70	4F	432	<DL	8.81	261	2720	1.71	33.3
70	5A	87.4	7.48	<DL	18	13300	<DL	1.21
70	5B	2400	1.8	14.2	332	12900	10.5	55.6
70	5C	608	<DL	13.9	449	9030	7.24	60.6
70	5D	2200	<DL	13.8	584	9220	12.2	85
70	5E	806	<DL	7.51	244	2910	1.89	56
70	5F	530	<DL	8.98	280	2890	1.86	45.7
70	6A	325	4.96	3.02	38	2280	<DL	5.63
70	6B	1840	1.28	15.6	255	5680	7.59	41.9
70	6C	1670	<DL	14.5	439	5500	10.9	73.5
70	6D	451	<DL	13.3	208	2190	2.72	26.3
70	6E	477	<DL	8.58	185	2390	1.24	43.8
70	6F	528	<DL	9.78	279	2800	1.49	35.2
70	BCAL	21.3	<DL	<DL	2.9	11900	<DL	<DL
70	BDOL	22	<DL	<DL	15.7	4050	<DL	<DL
70	R4	36.5	<DL	<DL	1.62	719	<DL	<DL
74	1A	197	16.9	3.02	35.1	2220	2.32	10.2
74	1B	1330	2.23	15	119	4670	4.89	25.9
74	1C	349	<DL	15.8	295	3680	4.07	41
74	1D	2090	<DL	13.8	457	5960	10.4	76.8
74	1E	302	<DL	7.75	173	2380	0.952	32.7
74	1F	436	<DL	9	237	2530	1.34	35
74	2A	208	13.8	3.47	57.7	6960	2.82	13.7
74	2B	1200	5.02	17.3	159	13900	5.78	32.2
74	2C	368	<DL	11.9	232	3940	3.48	32.6
74	2D	2840	<DL	14.3	578	7590	11.1	84.1
74	2E	507	<DL	8.65	241	2530	1.3	42.3
74	2F	953	<DL	9.82	324	2430	1.79	58.4
74	3A	210	17	3.05	38.6	3110	1.86	9.85
74	3B	979	<DL	7.92	106	2800	2.85	18.7
74	3C	999	<DL	10.9	281	2690	6.04	43.8
74	3D	2820	1.28	12.4	328	2740	6.26	46.2
74	3E	519	<DL	11.5	308	2500	2.09	54.9
74	3F	401	<DL	10.8	262	4070	1.41	37.2

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
74	4A	468	8.24	5.41	70.8	3540	3.91	17.2
74	4B	2940	<DL	11.6	252	4430	6.71	36.5
74	4C	705	<DL	9.76	171	3970	7.27	58.7
74	4D	2560	<DL	16.1	509	6350	12.7	90.2
74	4E	639	<DL	9.95	173	2570	1.27	48.4
74	4F	524	<DL	11.4	313	3730	2.08	41.3
74	5A	80.1	7.84	1.35	18	18900	<DL	1.45
74	5B	2290	1.57	15.9	312	16600	9.79	52.9
74	5C	646	<DL	15.9	422	13700	7.58	65.3
74	5D	2580	<DL	16	560	13500	12.7	90
74	5E	1120	<DL	8.9	272	4120	2.26	63.6
74	5F	670	<DL	10.6	333	3920	2.2	54.4
74	6A	553	6.81	4.21	77.1	3510	1.42	11.4
74	6B	1730	1.18	15.3	240	6680	7	40
74	6C	1980	<DL	14.4	422	6730	10.7	75.2
74	6D	466	<DL	14.5	214	2550	3.08	31
74	6E	565	<DL	8.75	198	2640	1.41	46.9
74	6F	552	<DL	10.5	312	2880	1.66	38.5
74	BCAL	15.3	<DL	<DL	2.8	12600	<DL	<DL
74	BDOL	3.3	<DL	<DL	16.1	4140	<DL	<DL
74	R5	<DL	<DL	<DL	<DL	<DL	<DL	<DL
77	1A	182	16.1	4.7	29.2	2150	2.02	8.32
77	1B	1660	2.81	18.8	181	6150	6.08	31
77	1C	324	<DL	15.5	270	3900	4.13	39.4
77	1D	2850	<DL	13.4	428	6450	11	75.5
77	1E	298	<DL	8.97	186	2640	1.1	32.3
77	1F	448	<DL	9.49	245	2660	1.39	33.7
77	2A	210	13.4	5.45	56.3	7360	2.73	12.9
77	2B	1040	5.24	15.9	143	13200	5.16	27.8
77	2C	427	<DL	12.3	239	4890	3.8	34.4
77	2D	2840	<DL	13.9	559	8900	11.8	85.5
77	2E	623	<DL	9.3	264	2790	1.48	42.7
77	2F	1130	<DL	10	335	2870	1.97	57.5
77	3A	188	14.9	5.91	34.3	2850	1.64	8.35
77	3B	888	<DL	9.83	92.9	2670	2.63	16.4
77	3C	1030	<DL	11.9	267	2800	5.66	39.9
77	3D	2690	<DL	12.9	310	2920	5.59	40.7
77	3E	583	<DL	11.5	318	2620	2.06	53.1
77	3F	544	<DL	11.3	292	4430	1.77	41.2
77	4A	401	7.91	8.27	90	4520	4.68	19.4
77	4B	2640	<DL	11.7	210	4280	5.98	30.9
77	4C	1460	<DL	13.1	407	5360	10.1	73

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
77	4D	2830	<DL	13.4	480	6220	12.4	84.6
77	4E	660	<DL	9.22	184	2720	1.32	46.5
77	4F	764	<DL	10.7	348	4350	2.48	45.9
77	5A	86	8.82	2.95	19.8	19600	<DL	1.67
77	5B	2180	1.61	14.3	280	16900	8.9	45.8
77	5C	734	<DL	15.2	416	15700	8.07	66.9
77	5D	3070	<DL	14.8	530	14800	13.9	86.5
77	5E	1350	<DL	9.15	295	4560	2.41	62.9
77	5F	878	<DL	10.5	351	4230	2.45	57.7
77	6A	524	4.81	4.56	63.1	2850	1.08	8.6
77	6B	1610	1.3	13.8	214	6190	6.45	34.7
77	6C	2030	<DL	14	416	6960	10.6	70.5
77	6D	527	<DL	13.4	201	2690	3.12	30.1
77	6E	683	<DL	9.38	210	2990	1.6	49
77	6F	685	<DL	10.4	339	3160	1.85	38.9
77	BCAL	9.61	<DL	1.21	2.92	13400	<DL	<DL
77	BDOL	0.734	<DL	1.13	15.1	3890	<DL	<DL
77	R6	<DL	<DL	<DL	<DL	<DL	<DL	<DL
82	1A	239	17.7	4.88	45.3	2620	3.02	12.5
82	1B	1870	2.85	21.5	224	7360	7.42	38.3
82	1C	410	<DL	16.2	288	4210	4.59	41.8
82	1D	2900	<DL	15.1	409	6230	10.9	75.6
82	1E	358	<DL	10.4	203	2750	1.35	33.9
82	1F	508	<DL	10	266	2840	1.49	35.6
82	2A	202	12.1	5.48	60.7	8190	3.01	13.8
82	2B	1200	4.53	17.8	178	19000	6.61	34.6
82	2C	527	<DL	13.3	262	5870	4.58	41
82	2D	4980	n.d.	15.3	586.5	9495	13.41	103.05
82	2E	960	<DL	9.97	303	2960	1.85	48
82	2F	1380	<DL	9.92	351	2950	2.05	59.3
82	3A	174	13.4	4.03	36	3340	1.84	9.1
82	3B	887	<DL	8.86	100	2860	2.66	16.6
82	3C	945	<DL	11.3	268	2800	5.37	37.2
82	3D	2650	<DL	12.9	268	2960	5.31	39
82	3E	615	<DL	11	314	2600	1.98	51.2
82	3F	888	<DL	10.2	337	4890	2.29	50.9
82	4A	247	6.45	4.92	53.3	2780	2.9	12.5
82	4B	2830	<DL	11.9	291	4520	6.39	33
82	4C	1790	<DL	13.2	393	4860	9.89	70.2
82	4D	2900	<DL	13	450	5950	13.6	81.9
82	4E	755	<DL	9.31	184	2950	1.5	46.6
82	4F	1190	<DL	9.9	374	4510	2.97	53

Table 13: cont

		Element, Unit, Detection Limit						
Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
82	5A	61.6	8.9	18.1	20.1	24000	<DL	1.47
82	5B	2020	1.47	14.1	260	14500	8.04	40.7
82	5C	896	<DL	15.3	394	16500	8.32	68.1
82	5D	2960	<DL	14.5	471	15300	14	86.8
82	5E	1520	<DL	9.37	291	4720	2.54	61.5
82	5F	1280	<DL	9.99	369	4420	2.82	62.3
82	6A	997	<DL	7.39	143	3320	2.03	16.3
82	6B	1560	1.27	13.9	207	5680	6.06	32.5
82	6C	1820	<DL	13.7	374	5790	9.14	59.8
82	6D	674	<DL	12.6	191	2860	3.32	30.7
82	6E	906	<DL	9.45	238	3100	1.77	48.6
82	6F	1020	<DL	9.99	360	3460	2.15	43.6
82	BCAL	8.65	<DL	1.09	2.84	12700	<DL	<DL
82	BDOL	<DL	<DL	1.17	13.9	3940	<DL	<DL
82	R1	<DL	<DL	<DL	<DL	<DL	<DL	<DL
84	1A	271	23.8	6.22	34.8	2550	2.58	11
84	1B	1760	3.66	21.1	167	6130	6.43	36.8
84	1C	549	<DL	16.7	292	5180	5.48	56.2
84	1D	3010	<DL	14.5	486	7150	12.4	99.3
84	1E	538	<DL	9.43	219	3700	1.67	44.4
84	1F	622	<DL	10.7	278	3820	1.8	46
84	2A	233	17.2	5.77	47.3	7220	2.54	13
84	2B	1070	6.34	17.2	130	16200	5.57	32.6
84	2C	720	<DL	13.3	259	7840	5.47	54.8
84	2D	3410	2.94	12.3	496	10500	12.2	99.5
84	2E	1310	<DL	10.1	305	4220	2.18	62.5
84	2F	1780	<DL	11.4	387	4120	2.49	75.3
84	3A	265	18.9	4.93	35.7	4600	1.89	9.79
84	3B	980	1.38	9.04	85.8	3830	2.65	18
84	3C	1130	<DL	12	242	4100	5.66	44.4
84	3D	2750	1.46	13.7	272	4580	5.83	49.9
84	3E	775	<DL	11.4	307	3210	2.21	64
84	3F	1390	<DL	12.3	381	5440	2.79	70.4
84	4A	341	9.74	6.78	57	4430	3.73	16.3
84	4B	2720	1.19	12.1	176	4770	5.74	32.7
84	4C	2340	<DL	14.2	449	5870	10.8	85.8
84	4D	3270	<DL	14.7	518	6790	13.2	106
84	4E	982	<DL	10.1	193	4140	1.65	58.3
84	4F	1840	<DL	11.6	449	5290	3.44	70.8
84	5A	113	12.7	3.04	20.2	22100	<DL	1.3
84	5B	1930	2.43	13.5	198	13900	7.11	40.5
84	5C	1160	<DL	16.2	388	19000	8.94	81.4

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
84	5D	3230	<DL	16.5	535	17600	14.7	113
84	5E	1970	<DL	9.87	281	5840	2.78	74.7
84	5F	1610	<DL	11.4	407	5270	3.07	76
84	6A	790	6.13	6.77	56.3	4690	1.33	9.33
84	6B	1650	1.91	15.1	164	5800	5.59	32.1
84	6C	2050	<DL	15.2	373	6410	9.23	68.6
84	6D	846	<DL	15.1	192	4710	3.92	39.2
84	6E	1200	<DL	11	214	4740	1.95	59.9
84	6F	1330	<DL	12.1	394	4940	2.45	54.6
84	BCAL	13.8	<DL	1.19	4.24	14800	<DL	<DL
84	BDOL	<DL	<DL	1.3	16.3	5490	<DL	<DL
84	R2	<DL	<DL	<DL	<DL	<DL	<DL	<DL
88	1A	315	23.6	6.12	52.1	4440	3.87	16.7
88	1B	1740	3.97	18.5	154	6170	5.74	33
88	1C	780	1.12	17.2	299	5810	5.95	57.8
88	1D	3460	<DL	15.1	486	8490	12.9	101
88	1E	858	<DL	9.36	241	4540	1.86	48.2
88	1F	802	<DL	10.2	296	4460	1.99	49.5
88	2A	254	17.3	6.35	60.8	10200	3.14	15.9
88	2B	930	6.79	16.4	112	13600	4.19	26.2
88	2C	972	<DL	13	239	7890	5.43	52.2
88	2D	6525	n.d.	16.05	580.5	11550	14.13	118.5
88	2E	2130	<DL	10.1	334	4840	2.57	68
88	2F	2270	<DL	11.5	380	4680	2.45	74.3
88	3A	231	17	5.01	41	5260	2.17	10.9
88	3B	1130	1.5	8.74	90.6	4340	2.77	18.5
88	3C	1180	<DL	11.7	239	4570	5.8	43.7
88	3D	2790	1.575	15	258	5475	5.73	51
88	3E	906	1.04	11.7	317	3840	2.2	64.9
88	3F	2200	<DL	12.5	440	7050	3.49	87.2
88	4A	480	9.555	7.965	80.4	6885	5.205	22.8
88	4B	2970	1.17	11.8	177	5150	5.72	32.4
88	4C	2210	<DL	13.8	376	5400	8.92	69.8
88	4D	3220	<DL	16.5	509	6950	12.8	98.5
88	4E	1190	<DL	11.3	201	4940	1.95	63
88	4F	2730	<DL	13.1	492	6160	4.12	83.5
88	5A	107	13.1	4.6	24.5	28800	<DL	0.848
88	5B	2160	2.22	14.8	209	15600	7.35	41.5
88	5C	1390	<DL	16.5	351	17600	8.31	73.6
88	5D	3060	<DL	16.8	471	16200	13.1	97.3
88	5E	2220	<DL	10.6	289	6470	2.85	77.1
88	5F	2600	<DL	12.7	472	6050	3.67	91.1

Table 13: cont

		Element, Unit, Detection Limit						
Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
88	6A	849	7.2	6.48	58.8	5350	1.37	10.2
88	6B	1840	1.81	14.7	175	6380	5.8	33.9
88	6C	2230	<DL	14.8	372	6980	9.11	68.1
88	6D	1150	<DL	14.9	193	5080	4.27	42.5
88	6E	1560	<DL	10.7	233	5170	2.22	64.8
88	6F	2060	<DL	12.3	442	5190	2.96	65.3
88	BCAL	8.5	<DL	4.84	3.81	18100	<DL	<DL
88	BDOL	<DL	<DL	1.27	12.1	5290	<DL	<DL
88	R3	<DL	<DL	<DL	<DL	<DL	<DL	<DL
91	1A	491	14.8	7.91	124	7010	8.6	39.8
91	1B	1450	2.87	16.4	143	4680	5.15	31.1
91	1C	831	<DL	15.2	304	4670	6.06	58.8
91	1D	2810	<DL	13	447	6540	11.5	94.6
91	1E	968	<DL	8.75	251	3560	1.95	50.2
91	1F	921	<DL	9.52	326	3610	2.08	55.7
91	2A	214	13.3	5.78	59.8	8550	2.96	15
91	2B	779	5.13	15.1	106	11300	3.79	24.5
91	2C	953	<DL	11.6	223	6070	4.93	50.2
91	2D	5700	1.95	18.3	741	14280	17.4	148.5
91	2E	2030	<DL	9.51	330	3850	2.38	65.8
91	2F	2300	<DL	10.2	382	3520	2.41	74.5
91	3A	172	11.5	5.36	33.5	3680	1.56	8.22
91	3B	996	<DL	9.64	90.1	3720	2.69	19
91	3C	1060	<DL	12	243	3890	5.46	44.4
91	3D	1540	<DL	9.03	158	2960	3.38	33
91	3E	853	<DL	11.7	318	3130	2.11	66.5
91	3F	2300	<DL	13.4	449	5680	3.33	91.4
91	4A	293	5.46	5.75	60	4150	4.15	19.9
91	4B	2860	1.05	11.4	179	4340	5.51	33.9
91	4C	1890	<DL	12.8	355	4140	8.11	67.2
91	4D	2760	<DL	13.3	444	5070	10.6	85.8
91	4E	1110	<DL	9.61	202	4060	1.86	62.2
91	4F	3200	<DL	11.8	520	5520	4.26	92.9
91	5A	102	9.04	3.75	28.9	23400	<DL	0.67
91	5B	1810	1.82	13.3	190	12700	6.46	39.9
91	5C	1220	<DL	15.1	320	14500	7.51	70.9
91	5D	2380	<DL	15.3	425	12300	11.2	87.1
91	5E	2080	<DL	9.94	294	5690	2.79	79
91	5F	2550	<DL	11	480	4850	3.54	93.6
91	6A	862	4.23	6.61	75.7	4590	1.54	12
91	6B	1710	1.46	13.7	180	5440	5.64	34.2
91	6C	1860	<DL	13.8	353	5270	8.32	64.8

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
		Element, Unit, Detection Limit						
91	6D	1070	<DL	13.5	185	4000	4.08	41.5
91	6E	1390	<DL	9.96	231	3890	2.03	63.6
91	6F	2370	<DL	11.8	469	4560	3.07	69.9
91	BCAL	9.52	<DL	1.34	4.04	11100	<DL	<DL
91	BDOL	<DL	<DL	1.33	14.3	4380	<DL	<DL
91	R4	1.55	<DL	<DL	<DL	<DL	<DL	<DL
95	1A	533	15.8	9.08	129	7520	9.09	41.1
95	1B	1630	2.67	17.7	159	5320	5.63	33.9
95	1C	1120	<DL	16.2	324	5250	6.76	63.6
95	1D	3280	<DL	15.7	496	7310	13	104
95	1E	1530	<DL	10.2	296	4320	2.27	58.7
95	1F	1650	<DL	11.1	395	4580	2.69	68.1
95	2A	226	12.2	6.38	69.3	10400	3.27	17
95	2B	803	5.57	17.1	113	12000	3.85	25.4
95	2C	1230	<DL	13.3	249	7150	5.9	58
95	2D	5190	n.d.	15.15	597	10950	14.415	127.2
95	2E	2520	<DL	10.6	371	4530	2.78	73.2
95	2F	2970	<DL	11.2	415	4080	2.57	79.6
95	3A	207	12.8	4.65	41.1	4340	1.85	9.71
95	3B	1010	<DL	8.51	95.1	4040	2.65	19.4
95	3C	1020	<DL	11	235	3990	5.26	43.2
95	3D	2160	2.64	12.21	225	4380	4.935	50.1
95	3E	846	<DL	11.1	301	3100	2.04	62.2
95	3F	2890	<DL	10.8	456	4920	3.52	92.7
95	4A	524	6.49	7.96	94.4	5170	5.62	26.7
95	4B	2950	<DL	11.3	184	4530	5.74	34.9
95	4C	1970	<DL	12.9	348	4280	7.94	65
95	4D	2960	<DL	13.6	464	5500	11.2	88.5
95	4E	1230	<DL	10.1	223	4210	2	66.1
95	4F	3500	<DL	11.1	488	5290	4.13	89.9
95	5A	88.65	8.34	3.48	24.9	21300	n.d.	n.d.
95	5B	1740	1.77	13.3	186	12100	6.2	37.7
95	5C	1200	<DL	14.3	291	13300	6.95	65.3
95	5D	2190	<DL	14.4	385	12000	10.2	79.2
95	5E	2080	<DL	9.44	289	5840	2.77	75.9
95	5F	3130	<DL	11	477	4790	3.63	97.2
95	6A	1266	n.d.	7.56	125.85	3690	1.74	16.2
95	6B	1840	1.46	14.2	192	5940	5.91	36.7
95	6C	1830	<DL	14	336	5280	8.04	62.2
95	6D	1160	<DL	13.7	186	4360	4.16	42.9
95	6E	1530	<DL	10.4	235	4190	2.08	62.8
95	6F	3080	<DL	11.3	478	4650	3.24	76.8

Table 13: cont

		Element, Unit, Detection Limit						
Time (days)	Column # and port location	Al μg/L 0.6	As μg/L 1	B μg/L 1	Ba μg/L 0.8	Ca μg/L 10	Cd μg/L 0.8	Co μg/L 0.6
95	BCAL	11.7	<DL	1.31	3.76	12900	<DL	<DL
95	BDOL	1.98	<DL	<DL	7.73	3450	<DL	<DL
95	R5	<DL	<DL	<DL	<DL	<DL	<DL	<DL
98	1A	422	17.9	10.9	81.9	4500	6.33	28.9
98	1B	1390	2.74	17.4	121	3920	4.96	30.4
98	1C	1390	<DL	18.7	320	5080	7.79	69.6
98	1D	2720	<DL	13.2	398	5970	11.5	91.2
98	1E	1690	<DL	9.85	285	3870	2.55	64.5
98	1F	2080	<DL	10.1	366	3750	2.9	74.2
98	2A	214	13.4	6.39	53.3	8390	2.87	16.1
98	2B	707	5.74	16	86.3	9480	3.36	23.3
98	2C	1290	<DL	14	230	7390	6.31	61.9
98	2D	3750	n.d.	12.84	432	9120	12.06	103.95
98	2E	2250	<DL	10.3	316	3890	2.65	73.2
98	2F	3040	<DL	10.9	358	3650	2.71	80.9
98	3A	194	13.8	4.32	30.9	3860	1.63	9.85
98	3B	922	<DL	8.92	77.6	3700	2.62	19.8
98	3C	967	<DL	11.2	217	3710	5.5	46.7
98	3D	1860	n.d.	11.58	180	4185	4.605	46.95
98	3E	775	<DL	11.3	260	2710	2.01	63.5
98	3F	2980	<DL	11.8	419	4620	3.47	96.3
98	4A	322	7.52	6.74	56.5	4110	3.79	18.8
98	4B	2500	<DL	11.1	143	3720	5.17	32.8
98	4C	1830	<DL	12.9	324	4090	8.23	68.1
98	4D	2720	<DL	13.7	411	5170	11.2	89.5
98	4E	1160	<DL	10	200	3780	2.06	66.8
98	4F	3610	<DL	11.4	446	4670	4.19	95.4
98	5A	31.4	8.64	3.04	18.9	18400	<DL	1.64
98	5B	1430	1.82	12.5	142	10300	5.33	34.1
98	5C	1020	<DL	14.1	239	11400	6.56	62.1
98	5D	2050	<DL	14.3	326	11300	9.76	77.4
98	5E	1890	<DL	9.67	257	5570	2.73	77.8
98	5F	3420	<DL	11.6	432	4760	3.76	101
98	6A	772	3.65	7.85	63.5	3640	1.28	12
98	6B	1590	1.1	15.3	156	4860	5.59	36.3
98	6C	1690	<DL	15.4	304	4930	8.2	66.2
98	6D	1020	<DL	13.2	45.9	3660	3.96	42.7
98	6E	1510	<DL	10.9	207	3850	2.09	64.2
98	6F	3200	<DL	11.8	407	3910	3.29	79.4
98	BCAL	10.1	<DL	1.19	2.66	11400	<DL	<DL
98	BDOL	2.93	<DL	1.57	11.6	4570	<DL	<DL
98	R6	<DL	<DL	<DL	<DL	<DL	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
103	1A	399	17.5	8	83.5	5050	6.62	31.7
103	1B	1550	3.01	16.6	127	5120	5.18	33.3
103	1C	1420	<DL	16.7	280	4830	7.18	64.7
103	1D	2895	n.d.	13.155	379.5	5700	11.01	89.55
103	1E	2020	<DL	9.41	291	4260	2.93	73.1
103	1F	3160	<DL	10.7	399	3970	3.5	89.5
103	2A	222	13.6	6.42	60.2	10600	3.25	18
103	2B	660	5.57	15.3	83.9	9880	3.21	23.5
103	2C	1250	<DL	12.7	200	6710	5.79	59.2
103	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
103	2E	2580	<DL	10.1	313	3880	2.83	77
103	2F	3390	<DL	10.4	339	3480	2.58	80.5
103	3A	173	12.2	3.32	28.8	3700	1.48	8.82
103	3B	997	1.01	8.43	84.9	3650	2.82	22.2
103	3C	1060	<DL	10.6	218	3790	5.65	48.8
103	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
103	3E	898	<DL	11.4	271	3100	2.24	70.1
103	3F	3990	<DL	11.5	469	4640	3.92	111
103	4A	462	6.87	7.635	80.25	6015	5.655	28.35
103	4B	2950	<DL	11.2	156	3810	5.52	36.9
103	4C	1760	<DL	12.8	290	3940	7.56	63.3
103	4D	2720	<DL	15.7	391	4840	10.6	87.6
103	4E	1280	<DL	11.3	208	4070	2.15	68.5
103	4F	3450	<DL	12.4	428	4740	4.25	97.4
103	5A	71.2	7.86	3.55	18.6	18400	<DL	1.42
103	5B	1500	1.64	13.4	143	10600	5.52	35.6
103	5C	932	<DL	13.9	213	10600	5.92	57.2
103	5D	1930	<DL	14.8	312	10600	9.44	74.8
103	5E	1940	<DL	10	253	5850	2.8	77.5
103	5F	3820	<DL	11.7	419	4610	3.77	103
103	6A	829	2.28	7.03	73.8	3230	1.36	13.9
103	6B	1690	1.42	14.3	160	5070	5.6	37.1
103	6C	1580	<DL	13.2	271	4570	7.33	61.4
103	6D	1200	<DL	13.6	157	3940	4.19	45.6
103	6E	1580	<DL	10.5	202	3780	2.08	63.1
103	6F	3910	<DL	12.1	408	4340	3.47	87.2
103	BCAL	1.01	<DL	1.2	2.89	13000	<DL	<DL
103	BDOL	<DL	<DL	1.14	7.78	3770	<DL	<DL
103	R1	<DL	<DL	<DL	<DL	<DL	<DL	<DL
105	1A	737	17.7	9.58	89	4410	5.87	23.3
105	1B	1380	2.8	15.5	126	4510	4.7	24.5
105	1C	1570	<DL	18.6	375	5820	8.31	60.5

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
		Element, Unit, Detection Limit						
105	1D	2990	<DL	13.3	483	6410	12.1	80.1
105	1E	2000	<DL	9.38	342	4360	2.98	62.4
105	1F	3320	<DL	10.2	464	3960	3.4	71.9
105	2A	226	14.2	5.71	53.5	7710	2.43	11.4
105	2B	767	5.87	17.7	100	10800	3.3	20.6
105	2C	1210	<DL	12.7	228	7080	5.85	48.9
105	2D	4630	1.23	13.2	489	10400	12.3	88.1
105	2E	2390	<DL	10.5	366	4070	2.89	63.9
105	2F	4140	<DL	12.2	467	4290	3.2	75.4
105	3A	203	11.7	5.21	26.5	2940	1.2	5.79
105	3B	908	1.05	10.4	88.3	3970	2.68	16.8
105	3C	1010	<DL	12.1	266	4130	5.92	41.5
105	3D	2230	<DL	13.1	250	4320	5.7	50.5
105	3E	851	<DL	12.3	303	2840	2.13	53.6
105	3F	4180	<DL	12.3	557	4370	3.76	86.2
105	4A	519	6.65	8.75	100	5190	6.07	23.9
105	4B	2550	<DL	11.4	159	4100	5.23	27.1
105	4C	1790	<DL	13	354	4380	8.03	53.7
105	4D	2600	<DL	13	457	5150	10.6	71.7
105	4E	1300	<DL	10.2	254	4080	2.31	58.1
105	4F	3640	<DL	11.5	506	5200	4.24	81.2
105	5A	84.7	8.18	2.56	25.7	18100	<DL	1.2
105	5B	1270	1.89	12	140	9330	4.72	24.8
105	5C	921	<DL	14.9	260	11600	6.44	49.1
105	5D	1750	<DL	13.8	353	10700	9.06	58.9
105	5E	1920	<DL	10	290	6220	2.85	61.5
105	5F	3720	<DL	11	479	4520	3.76	79.2
105	6A	675	3.86	5.31	57.8	2800	1.06	7.99
105	6B	1510	1.37	13.2	165	4660	5.24	27.2
105	6C	1790	<DL	15	357	5800	8.5	56
105	6D	1140	<DL	13	195	4070	4.51	38.8
105	6E	1610	<DL	10.2	237	3950	2.12	50
105	6F	3690	<DL	11.5	467	4190	3.51	67.7
105	BCAL	6.63	<DL	<DL	3.39	12200	<DL	<DL
105	BDOL	<DL	<DL	<DL	12.1	4000	<DL	<DL
105	R2	<DL	<DL	<DL	<DL	<DL	<DL	<DL
109	1A	332	14.6	6.17	72.2	4200	4.91	19.5
109	1B	1480	2.76	14.5	132	4390	4.86	24.3
109	1C	1257	n.d.	14.295	298.5	5430	6.66	47.25
109	1D	2820	<DL	15.5	463	5990	11.5	72.9
109	1E	2140	<DL	10.5	347	4760	3.14	64.9
109	1F	3830	<DL	11.5	472	4330	3.55	73.2

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
109	2A	210	12.2	6.15	55.4	8690	2.63	12
109	2B	665	5.16	15.8	98.7	10200	3.2	18.8
109	2C	1120	<DL	12.2	217	6560	5.73	46.3
109	2D	3015	n.d.	12.72	421.5	8610	10.62	77.4
109	2E	2510	<DL	10.2	364	4310	3.03	64.6
109	2F	3980	<DL	11.2	421	3740	2.79	69.1
109	3A	150	10.2	2.72	24.6	2990	1.14	5.5
109	3B	930	<DL	8.38	95.8	4100	2.75	17.3
109	3C	1050	<DL	10.4	273	4310	6.06	43.2
109	3D	1660	<DL	11.3	225	4120	5.1	46.6
109	3E	948	<DL	11.4	306	2890	2.11	52.2
109	3F	4850	<DL	11.7	580	4390	3.88	87.4
109	4A	403	5.67	6.9	79.9	4790	5.05	20.1
109	4B	2730	<DL	10.4	166	4290	5.38	28
109	4C	1760	<DL	12.5	337	4490	7.67	51.4
109	4D	2630	<DL	13.8	459	5350	10.8	71.3
109	4E	1400	<DL	9.79	268	4220	2.41	60.3
109	4F	3350	<DL	11.8	483	4990	4.1	79.2
109	5A	100.8	8.745	3.045	20.25	20400	n.d.	1.71
109	5B	1270	1.58	10.9	143	9240	4.82	25.3
109	5C	878	<DL	13.1	235	10600	5.93	45.6
109	5D	1610	<DL	13.5	318	10100	8.32	53.3
109	5E	1880	<DL	9.28	285	6270	2.78	60
109	5F	3930	<DL	11.4	467	4650	3.69	78.2
109	6A	636	4.04	5.13	54.4	3370	1.06	7.99
109	6B	1670	1.47	13.2	175	5160	5.42	28.9
109	6C	1570	<DL	13.1	308	4850	7.43	49.3
109	6D	1200	<DL	13.3	197	4300	4.67	40.1
109	6E	1680	<DL	9.88	236	4040	2.04	49.4
109	6F	3880	<DL	11.4	446	4210	3.39	66.9
109	BCAL	5.15	<DL	<DL	3.45	14400	<DL	<DL
109	BDOL	<DL	<DL	<DL	9.8	4270	<DL	<DL
109	R3	<DL	<DL	<DL	<DL	<DL	<DL	<DL
112	1A	1640	17	9.37	88	4390	6.15	28.1
112	1B	1480	3.04	15.4	127	4320	4.9	30.2
112	1C	1360	<DL	16.4	303	4330	6.99	60.1
112	1D	3020	<DL	14.2	469	5750	12.3	93.9
112	1E	2170	<DL	9.64	352	4660	3.37	87.2
112	1F	4160	<DL	11.1	476	4190	3.66	92
112	2A	198	13.2	5.67	51	8690	2.49	12.9
112	2B	889	5.22	15.7	132	15100	4.81	31.9
112	2C	1200	<DL	12.6	226	6630	6.38	61.1

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
		Element, Unit, Detection Limit						
112	2D	3630	<DL	14.5	471	8950	12.6	108
112	2E	2340	<DL	10.4	347	4300	2.96	76.9
112	2F	4370	<DL	11.6	425	3530	3.03	84.9
112	3A	172	12.9	3.45	25.7	3000	1.25	6.11
112	3B	872	<DL	7.91	84.4	3710	2.6	18.6
112	3C	1090	<DL	10.6	272	4300	6.46	55.3
112	3D	1560	<DL	11.8	222	4840	5.37	59.5
112	3E	982	<DL	11.8	303	2440	2.13	61.7
112	3F	5050	<DL	11.9	564	4310	3.8	102
112	4A	222	5.53	4.55	44.2	2750	2.88	12.6
112	4B	3060	<DL	12.3	175	4720	6.26	36.9
112	4C	1810	<DL	13	339	4430	8.05	64.9
112	4D	2710	<DL	14.5	460	5110	11.2	87
112	4E	1470	<DL	10.7	281	4450	2.62	77.1
112	4F	3290	<DL	11.9	455	4640	4.09	93.6
112	5A	90.4	10	5.7	19.2	21500	<DL	<DL
112	5B	1260	1.98	11.2	134	8580	4.71	28.9
112	5C	850	<DL	14.2	233	9960	6.18	55.6
112	5D	1680	<DL	14.4	326	9720	9.02	68
112	5E	1740	<DL	9.58	271	5640	2.78	70.3
112	5F	3620	<DL	11.2	414	4310	3.44	85.9
112	6A	861	2.72	9.45	94.8	2540	1.69	15
112	6B	1560	1.31	13.8	159	4490	5.3	32.4
112	6C	1520	<DL	13.7	294	4570	7.37	58.7
112	6D	1190	<DL	13.9	187	4270	4.9	48.8
112	6E	1710	<DL	10.6	233	3890	2.12	59.3
112	6F	3990	<DL	12.7	443	4410	3.56	82.6
112	BCAL	11.1	<DL	1.84	3.89	13200	<DL	<DL
112	BDOL	<DL	<DL	1.25	10.5	4290	<DL	<DL
112	R4	<DL	<DL	<DL	<DL	<DL	<DL	<DL
116	1A	353	15.3	6.65	86.7	4460	5.89	26.5
116	1B	1580	3.07	15	135	4500	5.37	30.9
116	1C	1370	<DL	15.9	304	4500	7.17	57.6
116	1D	3100	<DL	13.3	430	5400	11.2	82.9
116	1E	2330	<DL	9.59	371	5290	3.6	91.9
116	1F	4710	<DL	10.6	474	4110	3.56	87.7
116	2A	179	12.4	4.66	45	7330	2.22	10.6
116	2B	712	5.6	14.6	101	12000	3.75	24.2
116	2C	1240	<DL	12.4	233	7450	6.62	62.2
116	2D	3240	<DL	13.7	354	7100	9.45	83
116	2E	2480	<DL	10.4	358	4620	3.14	82.4
116	2F	3800	<DL	10.4	158	3380	2.8	79.1

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
116	3A	119	11.1	3.09	22.8	3250	1.07	5.08
116	3B	927	1.09	8.1	90.7	3950	2.8	20.1
116	3C	1140	<DL	10.9	284	4360	6.59	58.8
116	3D	1750	<DL	12.4	240	5800	5.86	66.5
116	3E	1120	<DL	11.7	326	2560	2.31	63.2
116	3F	5980	<DL	12	594	4420	4.08	107
116	4A	159	4.57	3.19	33.1	1930	2.13	8.94
116	4B	3290	<DL	10.9	182	4300	6.25	38.4
116	4C	1850	<DL	12.6	338	4460	8.06	64.2
116	4D	2130	<DL	14.1	117	4710	10	78.9
116	4E	1450	<DL	11	282	4370	2.65	77.7
116	4F	3340	<DL	11.6	197	4840	4.06	93.9
116	5A	85.9	9.85	4.29	17.6	21300	<DL	<DL
116	5B	1290	1.65	11.7	136	8890	4.87	29.9
116	5C	800	<DL	13.8	220	9320	5.87	53.9
116	5D	1620	<DL	14	299	9390	8.26	63.6
116	5E	1720	<DL	9.73	268	5930	2.85	69.5
116	5F	3960	<DL	11.4	406	4470	3.47	86.7
116	6A	511	3.29	6.85	76.5	2330	1.43	13.1
116	6B	1540	1.48	12.9	152	4610	5.04	30.9
116	6C	1430	<DL	12.9	276	4500	7.04	55.8
116	6D	1140	<DL	12.6	65.8	4380	4.86	48.7
116	6E	1740	<DL	9.92	228	3700	2.08	56.8
116	6F	3890	<DL	11.4	389	4300	3.3	77.4
116	BCAL	7.18	<DL	1.32	3.98	13400	<DL	<DL
116	BDOL	<DL	<DL	<DL	9.55	4110	<DL	<DL
116	R5	<DL	<DL	<DL	<DL	<DL	<DL	<DL
119	1A	446	13.9	7.78	99.1	5010	6.89	30.8
119	1B	1550	2.75	15.1	133	4520	5.17	30.7
119	1C	1500	<DL	17	317	4900	7.19	59.2
119	1D	3150	<DL	13.7	444	5920	11.2	84
119	1E	2370	<DL	10.4	382	5760	3.67	95.2
119	1F	5300	<DL	11.9	519	4410	3.64	90.6
119	2A	225	13	5.45	47.7	7380	2.27	11.5
119	2B	690	5.38	15.1	90.2	10100	3.08	21.2
119	2C	1210	<DL	13	229	7720	6.47	60
119	2D	4130	<DL	14.4	443	9170	12.1	106
119	2E	2500	<DL	12.4	376	5120	3.33	86.6
119	2F	5040	<DL	11.8	420	3740	2.9	81.1
119	3A	170	10.4	4.72	25.7	3510	1.2	5.6
119	3B	914	<DL	9.43	87.8	4260	2.6	18.8
119	3C	1120	<DL	12.2	280	4720	6.58	58.2

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
		Element, Unit, Detection Limit						
119	3D	1950	<DL	12.7	249	4910	5.94	67.4
119	3E	1290	<DL	13.4	347	2720	2.23	62.2
119	3F	6490	<DL	13	595	4610	3.78	101
119	4A	188	5.03	4.11	33.5	2030	1.94	8.39
119	4B	2950	1.01	11.1	165	4580	5.5	34.3
119	4C	2110	<DL	13.8	368	4860	8.7	69.3
119	4D	2720	<DL	14	441	5280	10.5	84
119	4E	1470	<DL	10.7	288	4580	2.65	76.3
119	4F	3580	<DL	12.4	471	5060	4.08	97.9
119	5A	80.7	8.79	3.09	13.2	17000	<DL	4.1
119	5B	1320	1.77	11.7	136	9150	4.78	29.7
119	5C	808	<DL	14.1	224	9930	5.97	53.3
119	5D	1670	<DL	14.4	296	9840	8.18	62.6
119	5E	1690	<DL	10.9	273	6360	2.68	69.1
119	5F	3960	<DL	12.1	402	4670	3.35	82.3
119	6A	720	3.99	5.82	50.5	2920	0.999	8.8
119	6B	1520	1.3	12.8	141	4700	4.6	28.6
119	6C	1440	<DL	13.7	274	4640	6.61	54.1
119	6D	1230	<DL	13.8	181	4650	4.67	49.1
119	6E	1820	<DL	11.1	238	4030	2.06	57.1
119	6F	3880	<DL	12.7	394	4620	3.24	78
119	BCAL	2.21	<DL	1.26	3.46	13000	<DL	<DL
119	BDOL	<DL	<DL	<DL	10	4370	<DL	<DL
119	R6	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123	1A	543	14.8	9.43	118	6950	8.31	36.9
123	1B	1690	2.91	16	146	4940	5.75	34
123	1C	1410	<DL	16	307	4510	7.07	56.1
123	1D	3570	<DL	17.6	502	6570	12.5	91.7
123	1E	2360	<DL	12	389	5830	3.78	97.6
123	1F	5760	<DL	12.7	549	4400	3.85	94.9
123	2A	248	13.8	8.06	53.4	8240	2.51	13
123	2B	1020	5.09	16.8	123	16100	4.46	28.4
123	2C	1010	<DL	13.1	208	7090	5.82	53.9
123	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
123	2E	2420	<DL	11.8	383	5500	3.5	89.9
123	2F	5340	<DL	12.5	424	3820	2.86	82.2
123	3A	174	12.6	3.77	25.2	3470	1.16	5.72
123	3B	969	1.01	9.06	96.1	4390	2.91	21.1
123	3C	1160	<DL	12.8	303	4880	7.17	63.1
123	3D	1930	<DL	12.9	253	6220	6.02	66.7
123	3E	1450	<DL	14	377	2770	2.3	64
123	3F	7050	<DL	12.9	646	4540	4.03	106

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
123	4A	266	5.59	5.96	44	2490	2.33	9.86
123	4B	3190	1.02	11.8	175	4540	5.9	35.6
123	4C	2040	<DL	13.4	366	4760	8.51	68.1
123	4D	2810	<DL	18.3	453	5420	10.7	84.9
123	4E	1550	<DL	11.9	328	4690	3.09	85.1
123	4F	3350	<DL	12.7	457	5160	4.08	95.9
123	5A	70.4	8.2	4.21	18.6	16400	<DL	<DL
123	5B	1300	1.6	12.7	137	9170	4.79	30.2
123	5C	794	<DL	14.7	226	9920	6.03	55.1
123	5D	1720	<DL	14.4	296	9700	8.01	60.6
123	5E	1560	<DL	10.6	256	6070	2.62	63.5
123	5F	3670	<DL	12	378	4640	3.19	76.8
123	6A	639	4.81	5.98	47	2760	0.958	8.22
123	6B	1550	1.35	13.2	148	4710	4.83	29.5
123	6C	1420	<DL	14.4	274	4760	6.76	55
123	6D	1260	<DL	14.4	184	4650	4.68	49.8
123	6E	1900	<DL	12.3	247	4180	2.14	58.4
123	6F	3480	<DL	12.8	355	4460	2.94	70.7
123	BCAL	1.7	<DL	1.2	4.52	12500	<DL	<DL
123	BDOL	<DL	<DL	<DL	3.5	1660	<DL	<DL
123	R1	<DL	<DL	<DL	<DL	<DL	<DL	<DL
126	1A	545	14.8	11.9	131	7090	8.73	40.1
126	1B	1470	3.07	15.5	132	4580	5.13	30.6
126	1C	1400	<DL	15.7	315	4580	7.22	57.3
126	1D	2940	<DL	14.5	469	5280	11.4	84
126	1E	2300	<DL	11.4	404	5510	3.78	99.7
126	1F	5480	<DL	12.1	556	4180	3.86	93.2
126	2A	214	13.1	6.1	45.4	6760	2.01	10.5
126	2B	686	5.24	14.5	103	11000	3.55	24.1
126	2C	1010	<DL	12.3	217	6420	5.98	56.6
126	2D	2660	1.68	12.9	363	8590	9.43	79.8
126	2E	2410	<DL	12.5	387	5450	3.59	92.6
126	2F	4750	<DL	12.2	410	3730	2.94	78.6
126	3A	167	10.5	3.36	22.5	2770	1.02	5.01
126	3B	904	1.16	9.22	88.7	3970	2.56	19.6
126	3C	1080	<DL	11.2	285	4670	6.65	60.9
126	3D	1680	<DL	12	242	4590	5.83	64.7
126	3E	1630	<DL	13.5	386	2350	2.26	62.1
126	3F	7450	<DL	13.8	704	4350	4.31	114
126	4A	219	4.6	4.42	38.6	2050	2.19	9.73
126	4B	2810	<DL	11.1	159	4410	5.43	33.7
126	4C	2230	<DL	15.1	403	4820	9.24	74.3

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
126	4D	2660	<DL	14.6	443	4870	10.4	82.2
126	4E	1580	<DL	11.4	337	4420	3.14	89.1
126	4F	3610	<DL	14	520	5410	4.62	111
126	5A	98.8	10.2	4.03	19.2	19800	<DL	<DL
126	5B	1180	1.46	10.8	124	8250	4.35	27.4
126	5C	784	<DL	13.7	234	9630	6.28	58.2
126	5D	1280	<DL	14.2	276	8550	7.41	57.8
126	5E	1560	<DL	10.9	267	5960	2.74	66.3
126	5F	3580	<DL	12.6	387	4450	3.27	79.3
126	6A	572	5.24	8	53.7	2460	1.07	9.73
126	6B	1410	1.42	13.4	135	4520	4.4	27.8
126	6C	1370	<DL	14.5	275	4730	6.85	55
126	6D	1050	<DL	14.9	188	4510	4.79	50.8
126	6E	1720	<DL	11.1	238	3510	2.06	55.5
126	6F	3230	<DL	13.3	359	4130	2.97	73.2
126	BCAL	5.27	<DL	1.19	4.41	10200	<DL	<DL
126	BDOL	<DL	<DL	3.99	6.82	2710	<DL	<DL
126	R2	<DL	<DL	<DL	<DL	<DL	<DL	<DL
130	1A	507	11.8	8.18	119	7110	8.19	38.1
130	1B	1870	2.6	16.2	165	5060	6.38	38.3
130	1C	1530	<DL	16	331	4690	7.55	61.3
130	1D	1990	<DL	10.3	135	4560	8.72	65.4
130	1E	2500	<DL	10.9	429	6080	4.09	107
130	1F	3660	<DL	8.23	170	2920	2.6	64.5
130	2A	228	10.7	5.67	77.9	13500	3.32	17.5
130	2B	1370	4.58	16.3	203	32200	8.46	53.5
130	2C	1170	<DL	12.8	258	8230	7.04	63.6
130	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
130	2E	2300	<DL	11.3	384	5930	3.66	96
130	2F	5300	<DL	12.1	413	3630	2.81	80.5
130	3A	171	11	3.93	31.1	3800	1.33	6.87
130	3B	942	1.19	8.62	97.8	4400	2.77	20.7
130	3C	1120	<DL	11.2	301	4870	7.11	64.1
130	3D	1390	<DL	12.3	143	6050	5.98	68.7
130	3E	1840	<DL	13.3	430	2560	2.4	64.5
130	3F	4230	<DL	7.84	352	3020	2.5	64.6
130	4A	221	4.41	4.37	44	2670	2.67	12
130	4B	3070	1.16	11.5	173	4710	5.75	35.7
130	4C	2040	<DL	12.5	384	4850	8.7	69.8
130	4D	2300	<DL	15.1	102	5040	10	78.5
130	4E	1520	<DL	11.6	336	4720	3.16	87.9
130	4F	1080	<DL	7.97	126	2600	1.74	40

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
130	5A	25.9	9.64	4.32	25.6	19900	<DL	<DL
130	5B	1220	1.64	11.5	127	8140	4.29	27.6
130	5C	763	<DL	13.8	232	9530	6.26	56.3
130	5D	1200	<DL	14.2	84	8680	7.34	58.3
130	5E	1440	<DL	10.5	264	6010	2.57	61.8
130	5F	2420	<DL	10	107	3960	2.54	61.5
130	6A	357	5.53	4.63	35.8	1820	<DL	6.02
130	6B	1480	1.39	12.6	141	4740	4.58	28.2
130	6C	1330	<DL	13.6	266	4770	6.41	51.3
130	6D	773	<DL	13.6	58.2	4430	4.57	46.9
130	6E	1780	<DL	11.3	241	3770	2.02	54.6
130	6F	2010	<DL	9.65	133	3240	2.18	52.1
130	BCAL	1.47	<DL	<DL	1.74	5480	<DL	<DL
130	BDOL	<DL	<DL	<DL	8.22	3410	<DL	<DL
130	R3	<DL	<DL	<DL	<DL	<DL	<DL	<DL
133	1A	562	12.1	8.82	131	7170	8.78	37.7
133	1B	1640	3.01	15.4	135	4950	5.51	30.6
133	1C	1590	<DL	16.2	342	5140	7.84	59.8
133	1D	3230	<DL	14.5	483	6320	11.7	85.1
133	1E	2240	<DL	10.7	393	5890	3.86	94.9
133	1F	5930	<DL	12.1	561	4330	3.77	87.2
133	2A	199	10.1	5.84	60.2	10700	2.46	12.1
133	2B	873	4.39	14.7	140	21800	5.54	34.4
133	2C	1340	<DL	12.5	273	10500	7.96	65.4
133	2D	3720	<DL	14.3	444	9450	12	98.6
133	2E	2170	<DL	11.6	384	6390	3.79	94.6
133	2F	5070	<DL	12.1	398	3810	3.04	73.6
133	3A	175	9.46	5.34	24.5	3140	1.04	4.29
133	3B	935	<DL	10.1	92.9	4660	2.77	19.5
133	3C	1070	<DL	12.1	289	5190	6.78	60.1
133	3D	1680	<DL	12.9	242	6580	6.33	65.4
133	3E	2000	<DL	14.5	436	2650	2.38	60.7
133	3F	7480	<DL	13.1	651	4720	3.99	99.3
133	4A	294	4.62	5.47	49.6	2890	2.82	10.9
133	4B	2520	<DL	11.1	140	4590	4.84	28.1
133	4C	2010	<DL	13.1	359	5030	8.4	63.3
133	4D	2560	<DL	14	414	5250	9.84	74.1
133	4E	1510	<DL	11.7	337	5160	3.2	84.2
133	4F	3380	<DL	12.7	481	5570	4.38	102
133	5A	89.1	8.87	4.8	36.7	19900	<DL	<DL
133	5B	1090	1.94	11	105	7430	3.76	22.3
133	5C	721	<DL	13.7	213	9610	5.89	50.2

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
133	5D	1260	<DL	14.1	271	9220	7.35	55.1
133	5E	1370	<DL	10.8	249	6330	2.52	58.2
133	5F	3300	<DL	11.7	345	4870	2.93	66.3
133	6A	553	6.28	5.46	42.1	2350	0.815	6.33
133	6B	1330	1.09	11.9	123	4780	4.06	23.6
133	6C	1160	<DL	13.2	238	4790	5.89	46
133	6D	908	<DL	13.6	170	4810	4.46	45
133	6E	1650	<DL	11.1	227	3670	1.91	49.5
133	6F	2870	<DL	12.6	320	4310	2.73	63.5
133	BCAL	5.76	<DL	<DL	3.8	10500	<DL	<DL
133	BDOL	<DL	<DL	3.37	10.9	4790	<DL	<DL
133	R4	<DL	<DL	<DL	<DL	<DL	<DL	<DL
138	1A	709	10.7	8.87	157	8220	10.9	46.7
138	1B	1790	2.53	14.6	154	5490	6.14	35
138	1C	1620	<DL	14.9	339	5160	7.7	60.5
138	1D	3290	<DL	14.7	475	6000	11.7	83.7
138	1E	2410	<DL	11.3	421	6350	4.08	99.6
138	1F	6270	<DL	12.4	546	4620	3.78	89
138	2A	204	8.1	6.29	70.1	11500	2.89	13.9
138	2B	657	4.13	13.9	109	15600	4.01	25.2
138	2C	1250	<DL	11.8	268	10100	7.67	64.1
138	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
138	2E	2100	<DL	11.2	382	6780	3.95	96.6
138	2F	5660	<DL	11.6	404	4050	2.95	77.8
138	3A	180	9.13	3.58	25.9	3180	1.02	3.37
138	3B	1070	1.09	8.84	106	5060	3.2	23
138	3C	1100	<DL	10.4	293	5540	7.14	64.1
138	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
138	3E	2650	<DL	13.7	481	3130	2.74	65.6
138	3F	8650	<DL	13.6	696	5250	4.6	114
138	4A	298	5.1	5.59	53.1	3340	3.1	12.2
138	4B	3080	<DL	10.5	160	4780	5.44	31.5
138	4C	2100	<DL	12.7	368	5200	8.69	67.1
138	4D	2430	<DL	12.5	355	5110	8.38	64.7
138	4E	1520	<DL	11.1	354	5340	3.45	87.8
138	4F	3260	<DL	12	458	5570	4.36	101
138	5A	43.8	5.18	2.23	15	11100	<DL	<DL
138	5B	1200	1.71	11	117	8290	4.24	25.9
138	5C	693	<DL	13.2	210	9420	5.85	50.4
138	5D	1950	<DL	14.1	265	9340	7.24	55
138	5E	1360	<DL	10.2	236	6540	2.46	55.4
138	5F	3440	<DL	11.3	346	4870	2.93	68.4

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
138	6A	469	5.71	5.48	44.2	2290	<DL	4.65
138	6B	1690	1.29	11.5	149	5180	4.91	28.7
138	6C	1200	<DL	12.9	241	5130	5.96	46.8
138	6D	990	<DL	13	159	4890	4.38	44.2
138	6E	1650	<DL	10.6	223	3750	1.91	48
138	6F	2870	<DL	11.9	305	4360	2.69	61.9
138	BCAL	2.98	<DL	<DL	3.78	11600	<DL	<DL
138	BDOL	<DL	<DL	<DL	7.41	3090	<DL	<DL
138	R5	<DL	<DL	<DL	<DL	<DL	<DL	<DL
140	1A	748	10.4	11.9	153	8490	10.4	44.9
140	1B	1680	2.73	14.7	127	5540	5.26	29.7
140	1C	1760	<DL	15.2	330	5360	7.7	56.8
140	1D	3450	<DL	14.1	434	6020	10.8	75.2
140	1E	2350	<DL	10.6	379	6060	3.72	88.7
140	1F	6200	<DL	12.8	507	4660	3.53	76
140	2A	199	9.48	5.57	53.8	10000	2.17	12.4
140	2B	626	4.86	13	90.2	13200	3.23	22.2
140	2C	1210	<DL	12.3	239	9420	7.07	56.5
140	2D	3930	<DL	14.6	475	12100	13.2	101
140	2E	2150	<DL	11.4	386	7130	4.08	99.5
140	2F	5410	<DL	11.8	405	4130	3.38	73.4
140	3A	176	10.4	2.22	26.4	2950	1.15	5.31
140	3B	822	1.1	6.12	81.8	4090	2.49	18.1
140	3C	1050	<DL	10.7	278	5000	6.85	59.8
140	3D	1800	<DL	9.78	246	4880	6.61	66.5
140	3E	2770	<DL	12.6	497	2910	2.73	60
140	3F	8630	<DL	12	689	4740	4.47	106
140	4A	211	5.36	2.05	35.7	1750	1.97	8.63
140	4B	2610	<DL	8.15	135	4240	4.7	27.8
140	4C	2270	<DL	10.5	353	4780	8.33	63.1
140	4D	2430	<DL	11.3	360	4740	8.65	64.4
140	4E	1490	<DL	8.31	329	4590	3.16	81.3
140	4F	3360	<DL	10.5	461	5540	4.76	101
140	5A	56.2	5.64	<DL	16.8	10600	<DL	<DL
140	5B	1020	1.87	7.55	86.1	6020	3.21	19.3
140	5C	692	<DL	10.9	201	9000	5.73	48
140	5D	1310	<DL	11.7	260	9340	7.22	54.1
140	5E	1310	<DL	7.64	229	6340	2.42	52.7
140	5F	3480	<DL	9.95	345	4740	2.99	64.7
140	6A	411	5.12	4.08	37.7	1460	<DL	6.75
140	6B	1640	1.17	10.9	146	4850	4.63	27.6
140	6C	1330	<DL	12.5	242	4740	6.27	48.4

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
140	6D	876	<DL	12.2	170	4570	4.81	47.7
140	6E	1730	<DL	9.6	226	3530	1.96	49.3
140	6F	2850	<DL	11.9	302	4170	2.65	59.7
140	BCAL	17.3	<DL	<DL	4.21	11600	<DL	<DL
140	BDOL	<DL	<DL	<DL	8.91	4130	<DL	<DL
140	R6	<DL	<DL	<DL	<DL	<DL	<DL	<DL
144	1A	784	12.6	6.24	187	8980	12.8	54.4
144	1B	1790	2.84	12.7	141	5060	5.85	32.4
144	1C	2000	<DL	15.1	393	5650	9.03	67.9
144	1D	3480	<DL	11.6	460	6480	11.5	81.1
144	1E	2580	<DL	8.89	433	6850	4.31	101
144	1F	6880	<DL	10.1	543	4640	3.77	82.4
144	2A	190	10.2	3.01	58.6	11400	2.4	12.2
144	2B	617	4.9	12.5	103	14500	3.67	24.4
144	2C	1150	<DL	10.4	252	9570	7.23	58.2
144	2D	2190	<DL	10.3	398	10700	11.4	89.6
144	2E	2240	<DL	10.4	408	8140	4.43	108
144	2F	5490	<DL	9.05	373	3950	2.96	70.4
144	3A	179	9.9	<DL	29.2	3640	1.21	5.9
144	3B	962	1.08	6.27	93.7	4430	2.86	21.3
144	3C	1050	<DL	8.35	282	5180	7.04	62.5
144	3D	1530	<DL	6.11	215	4510	5.15	57
144	3E	3290	<DL	12.5	526	3500	3.1	65.7
144	3F	9290	<DL	11.4	685	4890	4.64	114
144	4A	343	4.66	2.08	61.1	3390	3.61	15.2
144	4B	2770	<DL	8.08	137	4240	4.84	27.4
144	4C	2020	<DL	10	333	4540	8.07	60.6
144	4D	2540	<DL	13.2	356	4820	8.6	65.6
144	4E	1600	<DL	11.2	355	4970	3.49	88.2
144	4F	3440	<DL	11.1	460	5640	4.72	105
144	5A	46.2	5.09	<DL	12.5	9900	<DL	<DL
144	5B	1030	1.9	8.97	85.3	6070	3.21	20
144	5C	612	<DL	11.6	193	8610	5.51	47.6
144	5D	1410	<DL	12.3	250	9410	7.24	53.5
144	5E	1350	<DL	8.82	236	6850	2.49	55.3
144	5F	3570	<DL	9.96	326	4670	2.97	64.8
144	6A	361	4.87	1.7	34.8	1320	<DL	6.44
144	6B	1580	1.37	9.02	129	4740	4.4	26.2
144	6C	1280	<DL	11.6	242	4530	6.19	48.5
144	6D	878	<DL	11.2	164	4510	4.66	47.9
144	6E	1670	<DL	9.45	220	3350	1.9	47.3
144	6F	2680	<DL	10.2	265	4010	2.36	53.5

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
		Element, Unit, Detection Limit						
144	BCAL	4.8	<DL	<DL	3.73	10300	<DL	<DL
144	BDOL	<DL	<DL	<DL	6.85	3220	<DL	<DL
144	R1	<DL	<DL	<DL	<DL	<DL	<DL	<DL
147	1A	921	8	12.1	210	10900	14.3	62.8
147	1B	2200	2.56	16.2	179	6520	7.3	41.7
147	1C	1910	<DL	15.9	370	5440	8.48	64.1
147	1D	4250	<DL	17	556	8560	13.8	99
147	1E	2500	<DL	12	447	7270	4.16	103
147	1F	6650	<DL	13.4	590	4980	3.98	87.3
147	2A	190	8.61	6.27	56.9	11800	2.27	11.4
147	2B	602	4.74	13.9	94.2	13000	3.13	21.5
147	2C	1130	<DL	12.4	246	9540	6.78	56.1
147	2D	4110	<DL	22.2	515	14200	14.2	107
147	2E	2250	<DL	12	410	9490	4.73	114
147	2F	5960	<DL	13.8	423	5160	3.43	77.5
147	3A	184	8.54	6.34	28.8	3870	1.14	5.2
147	3B	883	<DL	10.4	87.3	4690	2.55	19.1
147	3C	934	<DL	11.5	255	5160	6.11	55.3
147	3D	1650	<DL	11.7	229	5390	5.83	60.9
147	3E	3440	<DL	15.3	526	4130	3.08	64.8
147	3F	10000	<DL	17.1	764	5980	5.12	125
147	4A	391	5.95	7.8	62.7	3800	3.49	15.5
147	4B	2680	<DL	10.7	143	4340	4.6	26
147	4C	2090	<DL	13.3	339	4990	7.98	60.7
147	4D	2390	<DL	13.6	351	5180	8.27	63.2
147	4E	1600	<DL	12.5	369	5400	3.55	88.9
147	4F	3390	<DL	13.3	487	6350	4.94	109
147	5A	55.5	5.74	2.61	18.7	13900	<DL	<DL
147	5B	1010	1.72	10.4	77.6	5760	2.9	17.3
147	5C	606	<DL	13.3	189	8700	5.45	46.1
147	5D	1240	<DL	17.1	247	9640	6.95	51.7
147	5E	1260	<DL	10.5	234	7230	2.44	54.1
147	5F	3540	<DL	12.9	348	5280	3.1	65.9
147	6A	442	5.57	4.76	39	1730	<DL	6.17
147	6B	1460	1.03	11.5	120	4880	4.04	23.9
147	6C	1360	<DL	13.9	251	5190	6.29	48.9
147	6D	811	<DL	13.7	164	4840	4.59	46.8
147	6E	1580	<DL	11.4	221	3480	1.87	46.5
147	6F	2540	<DL	13.1	271	4300	2.4	53.5
147	BCAL	4.93	<DL	<DL	4.21	11800	<DL	<DL
147	BDOL	<DL	<DL	<DL	8.48	4580	<DL	<DL
147	R2	<DL	<DL	<DL	<DL	<DL	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Al	As	B	Ba	Ca	Cd	Co
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
		0.6	1	1	0.8	10	0.8	0.6
151	1A	1040	10.1	10.8	230	12100	16	67.2
151	1B	2480	2.56	15.7	195	7200	7.97	45.5
151	1C	1950	<DL	14.1	371	5700	8.45	63.8
151	1D	3450	<DL	15.2	448	7050	11	80.5
151	1E	3060	<DL	13.6	509	8800	4.93	119
151	1F	7190	<DL	13.2	549	5060	3.77	83.2
151	2A	185	8.98	5.88	49.7	10200	2.03	9.8
151	2B	561	4.46	13.3	88.6	12200	2.91	20
151	2C	1070	<DL	11.7	233	9020	6.44	52.8
151	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
151	2E	2590	<DL	10.6	430	7340	4.2	101
151	2F	5450	<DL	12.3	394	4900	3.59	72
151	3A	204	10.7	5.3	41.1	5040	1.54	7.49
151	3B	1050	1.2	9.43	100	5580	2.99	21.9
151	3C	871	<DL	9.74	246	5390	5.99	54.1
151	3D	1530	<DL	11.3	223	5430	5.91	59.2
151	3E	3850	<DL	14.5	513	4640	3.24	66.1
151	3F	8850	<DL	13.4	661	5270	4.48	105
151	4A	184	3.85	3.72	27.1	1700	1.64	6.57
151	4B	2990	<DL	9.62	136	4600	4.66	27.4
151	4C	2400	<DL	13.3	390	5980	9.18	70.7
151	4D	2390	<DL	12.9	343	5190	8.05	61.8
151	4E	1520	<DL	11	354	5330	3.46	84
151	4F	3420	<DL	12.3	466	6150	4.72	103
151	5A	74.9	6.64	2.23	9.01	12500	<DL	<DL
151	5B	1020	1.73	10.1	80	5980	2.91	17.4
151	5C	571	<DL	12	174	8160	5	41.9
151	5D	1280	<DL	13.9	239	9400	6.59	49.6
151	5E	1250	<DL	10.1	228	7430	2.41	52.7
151	5F	3490	<DL	11.8	331	5190	3.05	63.9
151	6A	454	4.89	5.52	36.7	2020	0.843	7.49
151	6B	1440	1.23	10.3	113	4950	3.82	22.3
151	6C	1280	<DL	12.3	228	5040	5.79	44.7
151	6D	788	<DL	12.8	157	5040	4.51	44.5
151	6E	1630	<DL	11	216	3630	1.83	45.4
151	6F	2490	<DL	12.2	265	4410	2.33	52.2
151	BCAL	3.2	<DL	<DL	3.88	11900	<DL	<DL
151	BDOL	<DL	<DL	<DL	9.07	4070	<DL	<DL
151	R3	12.2	<DL	<DL	<DL	<DL	<DL	<DL
154	1A	517	7.84	9.63	126	6220	8.82	37.5
154	1B	2240	2.61	17	170	5990	7.25	40.9
154	1C	2290	<DL	15.8	428	6060	9.66	72.1

Table 13: cont

Time (days)	Column # and port location	Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
		Element, Unit, Detection Limit						
154	1D	3420	<DL	15	259	7210	11.7	84.3
154	1E	2610	<DL	11.7	456	7670	4.35	109
154	1F	6050	<DL	11.8	190	4580	3.64	77.8
154	2A	197	9.67	6.03	66.9	14700	2.58	12.8
154	2B	581	4.42	13	99.7	13200	3.28	23
154	2C	998	<DL	11.2	222	8130	6.24	51
154	2D	3220	<DL	13.2	424	11600	11.6	85
154	2E	2330	<DL	12.8	454	9990	5.29	129
154	2F	3970	<DL	9.6	154	3640	2.59	56.2
154	3A	199	10.5	5.19	37.1	4380	1.39	6.29
154	3B	897	<DL	8.6	88.1	4740	2.64	20.2
154	3C	892	<DL	9.73	245	4870	5.95	55.9
154	3D	1350	<DL	9.74	119	4690	5.68	58.1
154	3E	4150	<DL	15	529	4550	3.47	70.6
154	3F	6260	<DL	10.1	256	4220	3.3	77.7
154	4A	261	5.21	4.8	30.2	1740	1.96	7.77
154	4B	2840	<DL	9.63	129	4240	4.6	27.2
154	4C	2100	<DL	12.1	327	4650	7.78	60.9
154	4D	1960	<DL	13.2	175	4690	8.08	63
154	4E	1590	<DL	12	383	5290	3.72	95
154	4F	1640	<DL	7.61	229	4410	2.97	64.9
154	5A	25.7	7	7.47	11.4	11500	<DL	<DL
154	5B	954	1.47	11.1	70	5410	2.62	15.3
154	5C	548	<DL	12.8	169	7120	4.95	40.5
154	5D	1030	<DL	14.1	126	8530	6.42	47.6
154	5E	1220	<DL	10.6	229	7060	2.52	52.3
154	5F	3170	<DL	11.9	320	5250	2.93	60.2
154	6A	290	5.02	5.21	29.9	1220	<DL	5.02
154	6B	1430	<DL	11.2	113	5150	3.84	22.4
154	6C	1240	<DL	12.6	225	5250	5.94	44.4
154	6D	490	<DL	12.7	109	4930	4.62	45.5
154	6E	1550	<DL	10.9	213	3380	1.83	43.9
154	6F	1570	<DL	11.1	117	3980	2.13	44.8
154	BCAL	6.78	<DL	1.14	2.94	8250	<DL	<DL
154	BDOL	<DL	<DL	<DL	8.05	3840	<DL	<DL
154	R4	<DL	<DL	<DL	0.859	<DL	<DL	<DL
172	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	1B	1647	20.13	33	119.7	9720	5.79	29.43
172	1C	2430	<DL	13.8	429	6540	9.23	58.1
172	1D	4110	<DL	13	519	7860	11.9	72.6
172	1E	2340	<DL	9.8	481	7750	4.65	95.7
172	1F	7610	<DL	3.63	288	4290	2.9	58.2

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Al µg/L 0.6	As µg/L 1	B µg/L 1	Ba µg/L 0.8	Ca µg/L 10	Cd µg/L 0.8	Co µg/L 0.6
172	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2E	1870	<DL	9.08	456	10100	5.08	99
172	2F	7190	<DL	3.68	208	4440	2.34	44.6
172	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	3B	1000	3.28	7.36	144	8780	4.35	27.2
172	3C	851	<DL	9.89	285	7530	7.13	63.7
172	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	3E	5235	n.d.	12.075	552	5940	3.84	71.85
172	3F	9110	<DL	3.28	308	3840	2.84	62.9
172	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	4B	4530	1.03	8.46	212	4540	6.08	33.5
172	4C	1970	<DL	9.42	330	4470	7.35	50
172	4D	2250	n.d.	7.725	301.5	5790	6.99	49.8
172	4E	1420	<DL	9.31	420	6210	4.03	81.3
172	4F	4030	<DL	3.25	258	5240	3.29	66.5
172	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	5B	547.75	25.2	132.65	94.5	21350	2.0825	9.2925
172	5C	584	<DL	10	192	8200	5.12	37.3
172	5D	1720	<DL	8.39	214	8700	6.02	40.9
172	5E	1280	<DL	7.79	236	8670	2.55	46.9
172	5F	3680	<DL	3.34	188	4980	2.47	39.8
172	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	BCAL	31.7	<DL	1.5	2.61	15600	<DL	<DL
172	BDOL	2.32	<DL	3.52	11.3	5370	<DL	<DL

<DL under detectable limits
n.d. not analysed

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
0	1A	3.94	369	1390	0.701	19000	2.28	323
0	1B	2.69	592	645	2.38	19000	0.646	799
0	1C	1.5	44.8	58.6	4.59	19200	<DL	1040
0	1D	1.55	46	126	5.28	5240	<DL	1020
0	1E	1.41	15.6	136	5.15	11800	<DL	1970
0	1F	1.82	37.1	106	4.71	3880	<DL	2140
0	2A	2.71	347	1480	0.852	6710	0.889	270
0	2B	3.61	560	858	1.83	14400	0.42	651
0	2C	1.39	45.1	1050	5.35	13400	<DL	1120
0	2D	2.08	65.5	72.3	6.74	27800	1.15	1260
0	2E	1.38	13.2	154	3.66	7080	<DL	1230
0	2F	2.01	25.2	68.4	2.5	2760	<DL	1410
0	3A	3.05	392	1560	0.551	7850	0.804	388
0	3B	1.62	192	438	2.97	27600	<DL	493
0	3C	1.08	41	521	5.06	9000	<DL	845
0	3D	2.19	42.5	76.2	5.73	28900	<DL	1530
0	3E	1.47	13.4	188	3.31	12300	<DL	1440
0	3F	2.06	27.2	78.8	2.52	4700	<DL	1500
0	4A	0.483	61.1	199	0.178	2560	<DL	50.4
0	4B	1.11	123	61.8	3.21	16400	<DL	486
0	4C	0.827	39.8	309	4.96	8560	<DL	1020
0	4D	0.938	60.3	46.1	5.55	5940	<DL	1180
0	4E	1.64	14.9	151	3.74	7170	<DL	1700
0	4F	2.08	30.8	94.8	3.5	3280	<DL	1940
0	5A	0.75	107	357	0.272	5330	<DL	58.8
0	5B	1.45	231	177	1.8	26300	<DL	477
0	5C	0.793	40	433	4.99	13700	<DL	893
0	5D	0.917	50.5	28.4	5.8	6020	<DL	1020
0	5E	1.48	16.1	81.2	3.55	20800	<DL	1520
0	5F	2.08	29.5	90.9	3.54	3910	<DL	2030
0	6A	1.66	185	437	1.29	5250	0.465	257
0	6B	1.36	198	123	1.97	13000	<DL	473
0	6C	0.811	39.7	36.6	5.02	15700	<DL	1020
0	6D	1.37	84.6	59.6	6.05	10800	2.48	1290
0	6E	1.56	16.8	112	4	8500	<DL	1730
0	6F	1.94	32.1	109	3.96	4570	<DL	1980
0	BCAL	<DL	<DL	13.3	0.226	1410	<DL	28
0	BDOL	<DL	<DL	5.23	0.121	1060	<DL	12.5
0	R1	<DL	15.4	<DL	<DL	1680	<DL	<DL
4	1A	5.57	658	2350	1.17	24800	3.93	633

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
4	1B	2.69	571	757	1.86	8930	0.593	624
4	1C	1.42	44.6	579	4.54	4440	<DL	1020
4	1D	1.53	45.9	52	4.96	4780	<DL	960
4	1E	1.4	14.9	199	3.87	2350	<DL	1600
4	1F	1.76	35.6	72.4	3.76	2330	<DL	1690
4	2A	3.8	479	2060	0.844	8540	0.86	910
4	2B	3.14	616	726	2.94	11200	1.36	1200
4	2C	1.33	44.7	157	5.12	4760	<DL	1070
4	2D	1.25	48.7	248	5.16	4640	<DL	879
4	2E	1.35	10.6	471	3.44	2450	<DL	1230
4	2F	1.91	27.5	60.2	2.56	2280	<DL	1370
4	3A	2.68	350	1620	0.503	5450	0.876	3440
4	3B	1.77	214	509	3.26	5950	<DL	591
4	3C	1.1	39.1	1750	4.86	4390	<DL	876
4	3D	1.28	35.9	38.9	4.81	4590	<DL	1070
4	3E	1.48	15.1	37.5	3.5	2380	1.45	1460
4	3F	2.03	25.2	58.5	2.09	2890	<DL	1280
4	4A	1.3	152	536	0.333	2460	1.23	148
4	4B	1.08	123	99.6	3.12	4930	<DL	482
4	4C	0.866	43.9	206	5.08	4240	0.541	1010
4	4D	0.924	46.7	127	5.34	4250	<DL	1010
4	4E	1.57	15	466	3.55	2530	<DL	1690
4	4F	2	26.8	64.5	2.57	2110	<DL	1570
4	5A	2.55	269	1380	1.25	9290	<DL	1370
4	5B	1.44	236	211	2.07	6410	<DL	710
4	5C	0.776	37.5	2080	4.69	4210	<DL	899
4	5D	0.832	47.4	159	5.19	4330	<DL	913
4	5E	1.4	15.1	205	3.35	2350	<DL	1450
4	5F	1.98	30.7	68.9	2.55	2140	<DL	1560
4	6A	1.66	203	901	0.461	4730	<DL	4200
4	6B	1.49	219	144	2.36	5630	<DL	686
4	6C	0.861	39.8	133	4.88	4050	<DL	996
4	6D	1.09	47.3	46.2	5.14	4420	<DL	1010
4	6E	1.54	15.2	257	3.71	2510	<DL	1700
4	6F	1.95	30.5	71.1	2.64	2130	<DL	1550
4	BCAL	0.313	<DL	200	0.237	602	<DL	1420
4	BDOL	0.122	<DL	92.8	0.954	125	<DL	4390
4	R3	<DL	<DL	<DL	<DL	34.2	<DL	3.17
7	1A	2.97	334	1380	0.283	4680	1.9	267
7	1B	3.14	587	882	1.63	6820	1.92	570
7	1C	1.64	31.7	1390	4.29	4150	1.27	968

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
7	1D	1.68	44.5	50.9	5.09	4320	1.36	899
7	1E	1.56	13.5	276	3.45	2120	0.84	1410
7	1F	1.89	27.2	54.2	2.65	1930	1.5	1370
7	2A	1.67	297	879	0.277	5020	1.55	547
7	2B	3.21	563	665	2.34	9850	2.39	1120
7	2C	1.57	40.2	1140	5.21	4610	1.27	1060
7	2D	1.46	61.5	2320	5.47	4360	1.29	890
7	2E	1.54	6.11	1180	2.91	2080	0.681	1140
7	2F	2.36	31.8	59.3	2.55	2400	1.14	1470
7	3A	2.99	490	1770	0.606	6330	3.54	2880
7	3B	1.95	245	611	3.92	7040	1.87	839
7	3C	1.1	15.5	2750	3.99	4080	1.52	833
7	3D	1.56	47.6	42	5.78	4610	1.97	1120
7	3E	1.78	18.5	216	3.7	2200	1.02	1300
7	3F	2.15	23	52.4	1.79	2290	1.51	1210
7	4A	1.09	130	401	<DL	1570	2.45	132
7	4B	1.29	122	54.9	2.8	4750	1.46	431
7	4C	1.04	27.9	1510	4.71	4010	1.46	933
7	4D	1.15	43.9	353	5.01	3830	1.51	944
7	4E	1.74	7.46	1020	3.13	2280	0.859	1520
7	4F	2.26	28	57.8	2.19	1960	1.13	1420
7	5A	1.44	212	693	0.51	4850	1.82	795
7	5B	1.71	245	243	1.67	6210	1.53	604
7	5C	0.993	39	2100	4.88	4160	1.49	855
7	5D	7.92	45.2	129	5.6	4180	1.75	882
7	5E	8.03	10.7	595	3.08	2120	0.99	1340
7	5F	9.31	24.3	85.5	1.88	2010	1.24	1350
7	6A	13.7	162	541	0.213	2980	0.853	4360
7	6B	11.2	245	229	2.28	5900	1.62	802
7	6C	7.47	33.8	642	4.75	3870	1.68	950
7	6D	9.09	66.6	1350	2.32	4130	2.05	977
7	6E	9.44	11.9	516	3.23	2060	0.777	1450
7	6F	9.76	24	94.6	2.08	2000	1.16	1370
7	BCAL	7.69	<DL	201	<DL	221	1.47	953
7	BDOL	7.99	<DL	114	0.791	76.5	1.21	3650
7	R4	4.75	<DL	13.3	<DL	126	<DL	15
11	1A	12.7	408	1880	0.295	4940	2.14	284
11	1B	12.5	599	984	1.8	7670	2.24	609
11	1C	8.87	27.4	2520	4.07	4050	1.33	930
11	1D	1.68	42.8	45.3	4.85	4460	2.23	870
11	1E	1.68	10.6	584	3.3	2140	1.31	1350
11	1F	1.97	25.7	47.6	2.38	1970	2.11	1240

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
11	2A	2.4	428	1370	0.462	4930	1.99	485
11	2B	3.58	545	973	1.6	8160	2.52	865
11	2C	1.75	38.4	2770	5.8	4800	1.62	1020
11	2D	1.91	82.5	234	7.23	5220	2.33	923
11	2E	1.61	5.34	2580	2.92	2190	0.997	1100
11	2F	2.06	23.3	42	2.19	2200	1.07	1260
11	3A	4.34	770	2770	0.733	8020	3.75	3570
11	3B	2.13	239	710	3.77	7350	2.09	859
11	3C	1.45	14.8	4350	3.83	4000	1.43	775
11	3D	1.89	49.5	49.2	6.55	5230	1.88	1210
11	3E	1.78	6.64	1300	3.27	2270	0.913	1190
11	3F	2.16	23.4	50.5	2.01	2270	1.53	1290
11	4A	1.31	137	392	0.135	1560	2.99	163
11	4B	1.39	117	54.7	2.96	5170	1.39	408
11	4C	1.03	25.9	2110	4.51	4060	1.64	896
11	4D	1.16	41.2	36.5	5.84	4620	1.83	957
11	4E	1.77	4.57	2750	2.95	2260	0.879	1420
11	4F	2.24	24.3	43.5	1.94	1970	1.08	1300
11	5A	2.5	541	1050	0.813	8390	4.87	1390
11	5B	2.27	283	354	1.63	6200	1.42	544
11	5C	1.02	21.4	2840	4.22	4130	1.28	757
11	5D	1.04	46.7	172	5.96	4630	1.78	802
11	5E	1.72	9.5	1510	3.03	2070	0.665	1230
11	5F	2.17	24.5	42.9	2.04	1950	0.943	1340
11	6A	1.48	226	756	0.247	3190	0.909	3310
11	6B	2.15	245	207	2.34	6200	1.34	840
11	6C	1.14	29.5	1560	4.81	3960	1.56	938
11	6D	1.33	74.1	2760	5.61	4030	1.83	941
11	6E	1.82	8.61	1350	3.14	2110	0.772	1410
11	6F	2.18	23.7	51.1	2.12	2010	0.966	1360
11	BCAL	0.394	<DL	146	<DL	147	0.94	789
11	BDOL	0.244	<DL	47.2	0.379	61.5	0.98	3570
11	R5	0.113	<DL	<DL	<DL	19.3	<DL	13.3
14	1A	2.29	278	1280	0.414	4000	<DL	229
14	1B	3.79	729	1260	2.44	8920	1.17	684
14	1C	1.66	30.5	2320	4.43	4320	<DL	917
14	1D	1.3	34.6	47.7	4.31	4020	<DL	749
14	1E	1.46	8.11	1120	3.41	2210	<DL	1290
14	1F	1.79	24.4	56.5	2.61	1970	<DL	1210
14	2A	2.75	505	1850	0.586	5240	<DL	476
14	2B	3.81	661	1650	1.49	7820	<DL	665
14	2C	1.58	46.7	3050	6.59	4940	<DL	958

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
14	2D	1.4	56.5	76.4	6.24	4570	<DL	792
14	2E	1.4	5.82	2990	2.99	2180	<DL	1070
14	2F	1.85	20.6	53.5	2.49	2130	<DL	1220
14	3A	3.97	712	2750	0.914	6700	2.65	1640
14	3B	2.03	248	496	3.05	6830	<DL	666
14	3C	1.22	19.1	4780	4.2	4540	<DL	765
14	3D	1.31	30.7	54.1	5.34	4130	<DL	963
14	3E	1.6	7.27	2370	3.5	2350	<DL	1170
14	3F	1.8	19.4	54.2	2.06	2420	<DL	1240
14	4A	0.916	108	350	0.251	1410	<DL	111
14	4B	1.17	119	66.2	3.21	5970	<DL	415
14	4C	0.87	28.7	1960	4.76	4210	<DL	826
14	4D	0.932	37.8	32.5	5.46	4150	<DL	855
14	4E	1.53	4.9	2990	2.97	2250	<DL	1340
14	4F	1.93	21.1	55.6	2.26	1990	<DL	1350
14	5A	0.979	172	434	0.492	2710	<DL	387
14	5B	2.67	379	584	1.55	7120	<DL	451
14	5C	0.917	21.5	3030	4.62	4540	<DL	725
14	5D	0.856	39.4	127	5.6	4500	<DL	701
14	5E	1.58	9.24	2310	3.32	2320	<DL	1280
14	5F	1.94	21.3	54.1	2.21	2140	<DL	1400
14	6A	1.06	207	599	0.376	2870	<DL	2040
14	6B	2.06	260	252	2.69	7060	<DL	897
14	6C	0.91	31.5	2010	5.08	4290	<DL	918
14	6D	1.15	82.4	2480	6.22	4090	<DL	945
14	6E	1.62	8.71	1990	3.32	2350	<DL	1440
14	6F	1.95	20.4	56.2	2.31	2070	<DL	1320
14	BCAL	0.231	<DL	142	0.145	435	<DL	734
14	BDOL	0.145	<DL	58.2	0.896	254	<DL	3550
14	R6	<DL	3.33	8.59	<DL	458	<DL	<DL
18	1A	1.4	195	741	0.254	3080	<DL	177
18	1B	4.52	931	1720	2.86	10500	<DL	863
18	1C	1.54	27	2850	4.8	4630	<DL	884
18	1D	1.24	41.2	38.8	4.58	4080	<DL	695
18	1E	1.44	5	2360	3.34	2260	<DL	1250
18	1F	1.75	26.4	51.2	2.44	2030	<DL	1120
18	2A	4.36	730	2850	0.925	6920	<DL	875
18	2B	4.02	698	1890	1.36	7560	<DL	613
18	2C	1.49	49.8	2730	7.02	5030	<DL	940
18	2D	1.4	58	67.5	6.51	4820	<DL	722
18	2E	1.4	5.84	3400	3.1	2250	<DL	1030
18	2F	1.77	23.2	52.3	2.76	2330	<DL	1280

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
18	3A	2.57	460	1690	0.6	4750	<DL	1350
18	3B	2.04	253	506	2.53	5900	<DL	553
18	3C	1.2	17.7	5400	4.48	4580	<DL	738
18	3D	<DL	<DL	8.94	<DL	<DL	<DL	n.d.
18	3E	1.56	6.6	3220	3.43	2380	<DL	1090
18	3F	1.7	21.4	57.9	2.39	2570	<DL	1310
18	4A	0.495	77.3	239	0.152	1190	<DL	75.1
18	4B	1.31	135	80.5	3.99	6710	<DL	491
18	4C	0.788	28.1	2320	4.91	4290	<DL	757
18	4D	0.705	39.8	24.1	1.69	4140	<DL	777
18	4E	1.43	4.4	4030	3.07	2300	<DL	1310
18	4F	0.709	9.68	22.9	0.976	1640	<DL	808
18	5A	0.887	212	414	0.532	3040	<DL	615
18	5B	2.73	419	731	1.38	6070	<DL	392
18	5C	0.766	21.2	3160	4.79	4530	<DL	682
18	5D	0.411	24.1	187	2.47	3730	<DL	368
18	5E	1.4	8.98	2920	3.32	2180	<DL	1190
18	5F	1.75	22.9	44.5	2.32	2050	<DL	1370
18	6A	2.06	333	1010	0.933	4270	<DL	3820
18	6B	2.23	302	332	2.92	7420	<DL	967
18	6C	0.898	31.9	2410	5.49	4360	<DL	907
18	6D	0.587	60.2	1380	2.64	3010	<DL	492
18	6E	1.51	8.83	2750	3.3	2220	<DL	1380
18	6F	0.847	10.2	26.6	1.25	1870	<DL	919
18	BCAL	0.142	<DL	143	<DL	25	<DL	472
18	BDOL	0.138	<DL	59	0.715	<DL	<DL	4380
18	R1	<DL	<DL	<DL	<DL	<DL	<DL	4.2
21	1A	1.32	202	693	0.174	3400	0.854	204
21	1B	4.79	1040	1960	2.57	9920	2.06	818
21	1C	1.55	31.7	2790	4.62	4890	0.881	832
21	1D	1.28	64.9	29.7	4.34	4550	1.47	659
21	1E	1.51	5.8	2950	3.08	2380	<DL	1140
21	1F	1.81	30	40.3	2.56	2160	0.703	1160
21	2A	2.94	513	1790	0.554	4800	1.66	575
21	2B	4.38	832	2350	1.31	7630	1.09	648
21	2C	1.35	56	1970	7.52	5170	0.797	825
21	2D	1.5	84.3	64	5.37	5310	3.69	661
21	2E	1.56	6.24	4330	3.07	2430	<DL	1050
21	2F	1.89	25.8	37.2	2.81	2470	<DL	1330
21	3A	4.54	864	2980	1.14	7630	4.49	1820
21	3B	2	263	462	1.92	5490	1.16	499
21	3C	1.23	19.1	5620	4.45	4840	0.877	687

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
21	3D	1.38	46.6	53.5	5.81	5130	1.62	941
21	3E	1.72	6.44	4280	3.32	2530	0.505	1090
21	3F	1.8	22.7	42.1	2.32	2630	0.729	1300
21	4A	1.1	210	452	0.181	1950	0.661	201
21	4B	1.59	178	128	3.77	7290	1.02	515
21	4C	0.832	30.2	2090	5.06	4670	0.711	714
21	4D	0.795	43.5	16	5.22	4330	0.908	725
21	4E	1.54	4.8	4590	2.77	2480	<DL	1170
21	4F	1.79	27.5	32.6	2.16	2200	<DL	1360
21	5A	1.21	343	707	0.448	4500	0.676	534
21	5B	3.29	534	909	1.39	6750	0.629	433
21	5C	0.861	23.4	3340	4.48	4710	0.771	607
21	5D	0.9	44.9	29.4	5.74	4680	0.992	608
21	5E	1.55	9.84	3060	3.35	2490	<DL	1150
21	5F	1.86	25.1	33.9	2.4	2200	<DL	1420
21	6A	1.53	332	1020	0.354	3360	<DL	2350
21	6B	2.76	388	486	2.57	7660	0.635	955
21	6C	0.995	35.8	2660	5.64	4770	0.829	869
21	6D	1.24	103	4920	6.22	3790	0.936	766
21	6E	1.62	9.05	3040	3	2460	<DL	1300
21	6F	1.98	24.2	40.3	2.16	2240	0.717	1340
21	BCAL	0.266	<DL	103	<DL	175	<DL	338
21	BDOL	0.21	<DL	44.7	1	95.6	0.428	3530
21	R2	0.0621	2.63	<DL	<DL	62.8	<DL	18
25	1A	1.18	199	505	0.256	3800	0.743	361
25	1B	4.48	968	1800	2.59	10500	2.11	893
25	1C	1.49	31.1	2410	4.56	5230	0.724	790
25	1D	1.11	37.1	20.1	4.56	4600	1.49	627
25	1E	1.45	5.53	3170	3	2310	<DL	1050
25	1F	1.74	23.8	35.7	2.45	2270	0.728	1110
25	2A	2.59	444	1520	0.621	4950	1.49	690
25	2B	4.48	814	2310	1.47	8090	1.24	725
25	2C	1.45	57.8	2430	6.51	5090	1.04	667
25	2D	0.749	13.9	<DL	0.761	1090	<DL	184
25	2E	1.46	6.64	4830	3.01	2500	<DL	1000
25	2F	1.81	22.2	38.3	2.85	2510	0.424	1270
25	3A	58.1	416	1580	0.582	4330	1.57	1030
25	3B	23.2	240	487	1.99	5630	0.816	653
25	3C	21	21.2	5720	4.34	4930	0.545	638
25	3D	21.6	34	114	4.74	4070	0.461	741
25	3E	21.9	7.34	5480	3.28	2690	<DL	1030
25	3F	23.7	22	120	2.43	2750	0.485	1270

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
25	4A	22.3	129	390	0.207	2630	0.521	310
25	4B	24.5	202	249	3.5	7070	0.759	489
25	4C	20.7	32.6	1770	5.45	5050	0.675	682
25	4D	20.9	43	84.6	5.67	4580	0.956	706
25	4E	17.8	5.61	5410	2.81	2460	<DL	1180
25	4F	23.5	24.8	106	2.32	2400	0.414	1420
25	5A	24.1	292	690	0.341	3640	<DL	488
25	5B	29.8	546	1030	1.77	7860	0.877	588
25	5C	21	25	3650	4.68	4840	0.644	590
25	5D	21.3	40.4	83.9	5.75	4870	1.01	570
25	5E	21.8	12.4	3390	3.28	2400	<DL	1060
25	5F	23.5	23.7	114	2.49	2390	<DL	1330
25	6A	26.7	329	973	0.756	4210	0.714	2980
25	6B	28.4	412	626	2.6	8040	0.656	1020
25	6C	23	40.1	2600	5.79	4860	0.745	813
25	6D	27.4	115	3240	5.78	3800	0.78	708
25	6E	21.5	10.5	3140	3.08	2340	<DL	1280
25	6F	24.3	23	115	2.49	2400	<DL	1270
25	BCAL	22.4	<DL	158	<DL	211	<DL	207
25	BDOL	21.6	<DL	102	0.561	82.7	<DL	2560
25	R3	17.1	14.3	25.6	<DL	46.9	<DL	8.24
28	1A	0.954	139	355	0.401	3900	1.69	591
28	1B	3.23	588	1290	2.23	10500	2.83	959
28	1C	1.12	24	1970	3.95	5020	1.93	740
28	1D	1.05	27.7	36.6	4.12	4700	2.85	649
28	1E	1.24	4.76	3790	2.4	2240	1.85	1140
28	1F	1.66	15.1	24.1	2.07	2120	2.34	1210
28	2A	1.52	242	787	0.272	3230	2.72	472
28	2B	3.26	488	1610	1.14	7390	2.49	717
28	2C	1.09	35.1	1270	4.8	4770	2.49	529
28	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
28	2E	1.18	4.33	4920	2.46	2200	1.81	1080
28	2F	1.62	16.5	39	2.51	2480	2.7	1330
28	3A	1.37	249	897	0.439	3750	2.31	1270
28	3B	1.33	179	252	1.96	5830	2.95	998
28	3C	0.818	14.6	4140	3.32	4580	2.78	555
28	3D	1.07	27.2	36.2	4.05	4290	3.38	756
28	3E	1.33	6.6	4930	2.77	2230	2.81	1120
28	3F	1.54	15.9	35.4	2.11	2590	2.62	1300
28	4A	0.295	58.8	145	0.24	1480	2.08	296
28	4B	1.41	143	148	2.84	6490	2.9	496
28	4C	0.664	22.4	1180	4.91	5180	3.14	636

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
28	4D	0.624	29.9	14.2	4.96	4440	2.92	669
28	4E	1.29	4.3	5210	2.21	2120	2.75	1190
28	4F	1.41	17.2	27.3	1.85	2140	2.4	1310
28	5A	0.715	224	433	0.191	2420	2.51	335
28	5B	2.95	386	776	1.49	7170	2.54	597
28	5C	0.956	19.9	3800	4.11	5230	5.41	613
28	5D	0.605	28.1	26.1	4.4	4340	2.55	499
28	5E	1.15	8.03	3800	2.86	2120	2.34	1160
28	5F	1.87	15.7	34.5	2.25	2420	4.43	1520
28	6A	1.1	175	427	0.63	3160	2.58	2350
28	6B	2.34	278	433	2.45	7870	1.86	1210
28	6C	0.746	25.6	2120	5.27	4970	2.48	790
28	6D	0.851	66.7	2580	1.18	3570	2.73	633
28	6E	1.33	7.15	3260	2.47	2090	2.27	1310
28	6F	1.47	16.5	29.6	2.06	2020	1.52	1240
28	BCAL	0.073	<DL	74.3	<DL	126	0.844	263
28	BDOL	<DL	<DL	34.1	0.859	75.2	0.498	2950
28	R4	<DL	22.5	<DL	<DL	56.4	<DL	28.6
32	1A	0.932	201	335	1.05	4910	1.47	1310
32	1B	2.68	544	971	2.58	10100	2.57	1110
32	1C	1.16	23.2	1750	4.66	5420	1.46	822
32	1D	0.926	28.1	23.9	4.74	4770	1.88	665
32	1E	1.12	5.18	3640	2.31	1960	1.44	1060
32	1F	1.44	17.1	32.5	2.29	2040	1.15	1140
32	2A	1.22	225	726	0.511	3760	0.834	759
32	2B	3	467	1440	1.34	7150	1.32	857
32	2C	0.916	34	573	4.63	4880	1.81	500
32	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
32	2E	1.2	5.66	5300	2.61	2270	1.19	1090
32	2F	1.46	17.8	58.9	2.9	2540	1.27	1300
32	3A	0.975	203	599	0.599	3980	1.13	1850
32	3B	1.04	202	243	2.75	6290	1.29	1660
32	3C	0.698	15.9	3810	4.01	4910	0.961	603
32	3D	0.739	26.6	35.7	4.4	4180	0.965	651
32	3E	1.28	8.09	5910	2.85	2500	1.05	1120
32	3F	1.31	15.5	44.5	2.18	2640	0.805	1230
32	4A	0.356	82.4	170	0.444	1810	1.14	616
32	4B	1.21	130	122	3.07	6640	0.847	610
32	4C	0.515	24.1	903	4.88	5070	0.811	613
32	4D	0.426	31.2	16.1	5.27	4670	<DL	641
32	4E	1.23	4.5	5790	2.43	2200	0.908	1180
32	4F	1.28	17.3	35.5	2.02	2200	<DL	1320

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
32	5A	0.398	162	304	0.141	1720	<DL	237
32	5B	2.45	344	641	1.81	7610	0.503	782
32	5C	0.486	18.9	2780	4.11	4980	<DL	536
32	5D	0.597	32.4	40	4.75	4820	0.896	539
32	5E	1.21	8.46	3810	3.01	2760	<DL	1160
32	5F	1.41	16.1	35.1	2.26	2240	<DL	1370
32	6A	0.574	106	209	1.54	4000	<DL	4650
32	6B	1.71	274	287	4.11	10700	<DL	2060
32	6C	0.67	28.2	1640	5.31	4960	<DL	801
32	6D	0.804	64	2890	4.25	3680	<DL	631
32	6E	1.15	7.54	3450	2.62	2100	<DL	1300
32	6F	1.33	16.8	35.5	2.3	2220	<DL	1280
32	BCAL	<DL	<DL	75.4	<DL	210	<DL	232
32	BDOL	<DL	<DL	31.8	0.645	41.4	<DL	2840
32	R5	<DL	8.13	11.1	<DL	51.8	<DL	27.5
35	1A	0.952	200	311	1.13	6230	<DL	1350
35	1B	2.62	613	824	3.35	12200	0.798	1280
35	1C	1.24	24.8	1500	4.98	7940	<DL	808
35	1D	1.07	32.8	15.6	5.68	5830	<DL	674
35	1E	1.22	6.08	3840	2.52	4100	<DL	999
35	1F	1.78	17.5	52.3	2.62	2980	<DL	1110
35	2A	1.15	202	554	0.378	4070	<DL	683
35	2B	2.89	445	1250	1.5	10800	<DL	992
35	2C	1.1	35.9	583	4.4	8340	<DL	436
35	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
35	2E	1.52	7.02	5910	2.79	4850	<DL	1030
35	2F	1.82	20.6	82.5	3.19	3630	<DL	1260
35	3A	0.824	174	413	0.545	4430	<DL	1930
35	3B	1.36	232	254	3.13	9540	<DL	2150
35	3C	0.898	17.9	3770	4.81	7230	<DL	660
35	3D	1.09	47.2	84.8	5.27	8900	<DL	591
35	3E	1.88	15.8	6200	3.59	7720	<DL	1100
35	3F	1.65	15.6	49.4	2.34	3630	<DL	1210
35	4A	0.422	76.4	123	0.383	1890	<DL	492
35	4B	1.47	156	118	3.6	8890	<DL	773
35	4C	0.827	27.9	860	5.59	7870	<DL	615
35	4D	0.789	35	27.5	6.53	5290	<DL	649
35	4E	1.45	5.31	6220	2.36	4440	<DL	1080
35	4F	1.75	20.4	36.9	2.33	2940	<DL	1340
35	5A	0.515	125	232	0.144	3900	<DL	224
35	5B	2.85	360	633	2.25	15400	<DL	943
35	5C	0.831	22.6	2480	4.58	7210	<DL	511

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
35	5D	0.833	36.2	64.7	5.47	5160	<DL	511
35	5E	0.481	10.8	3790	4.06	4810	0.409	1030
35	5F	0.668	20	26.7	3.02	3470	0.845	1210
35	6A	<DL	61.1	66.5	2.27	6150	0.918	3060
35	6B	0.839	347	241	5.48	15000	1.6	2220
35	6C	<DL	42.7	1600	10.5	10600	1.38	936
35	6D	0.199	86.3	1210	6.26	5200	1.79	513
35	6E	0.472	10.2	3060	3.67	4660	0.552	1190
35	6F	0.587	18.2	22.4	3.04	3250	0.626	1110
35	BCAL	<DL	<DL	53.6	<DL	4040	0.472	181
35	BDOL	<DL	<DL	14.6	0.833	244	<DL	2140
35	R6	<DL	4.99	<DL	<DL	325	<DL	<DL
39	1A	0.35	278	332	2.1	10700	1.25	1860
39	1B	1.33	895	566	5.78	20000	3.12	1740
39	1C	0.341	32.1	1140	6.86	11500	0.698	843
39	1D	0.145	35.8	7.8	7.61	8060	1.73	660
39	1E	0.369	7.88	3450	3.41	5360	0.55	937
39	1F	0.598	20.4	29.5	3.26	3140	1.09	1020
39	2A	0.319	238	481	1.24	6490	0.848	1220
39	2B	1.25	495	829	2.34	13700	1.39	1100
39	2C	0.158	40.3	201	5.52	10200	0.945	388
39	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
39	2E	0.411	8.61	5600	3.53	10700	<DL	930
39	2F	0.576	23.5	79.3	4.41	3730	0.896	1100
39	3A	<DL	218	332	1.47	5580	0.539	4090
39	3B	0.309	276	252	4.39	8330	1.44	2760
39	3C	<DL	21.9	2780	6.42	9710	0.674	686
39	3D	0.151	37.5	27.9	8.27	11600	1.67	622
39	3E	0.54	16.4	5970	4.7	7310	<DL	990
39	3F	0.474	18.8	33.4	3.09	3910	0.415	1060
39	4A	<DL	134	114	0.917	3320	0.56	930
39	4B	0.267	216	65.3	6.86	11400	1.39	1060
39	4C	<DL	34.6	693	8.19	8100	0.862	622
39	4D	<DL	41.6	11.1	8.84	7580	1.29	637
39	4E	0.377	6.38	6410	3.21	4090	<DL	1020
39	4F	0.441	20.1	14.3	2.73	2980	0.436	1120
39	5A	<DL	74.1	80.7	0.133	9540	<DL	182
39	5B	0.967	403	392	4.18	19500	1.21	1120
39	5C	<DL	24.6	1670	6.48	8720	0.787	518
39	5D	<DL	42.6	16.7	7.1	6410	1.24	463
39	5E	0.323	11.7	3700	3.92	4530	<DL	987
39	5F	0.467	19.9	10.8	2.82	2900	0.469	1080

Element, Unit, Detection Limit applies to columns Cr through Mg.

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
39	6A	<DL	114	105	2.12	17400	4.88	6990
39	6B	0.626	362	180	6.34	16000	1.39	3090
39	6C	<DL	48.5	87.1	12.5	10100	1.35	1020
39	6D	0.134	70.2	3960	6.06	5820	1.2	632
39	6E	0.341	10.5	2930	3.24	3170	<DL	1060
39	6F	0.519	20.2	10.5	3.21	2880	0.84	1080
39	BCAL	<DL	<DL	38.7	<DL	693	<DL	162
39	BDOL	<DL	<DL	<DL	0.649	496	<DL	2110
39	R1	<DL	4.02	<DL	<DL	547	<DL	<DL
42	1A	0.691	165	151	1.19	9870	<DL	1300
42	1B	2.17	848	454	6.03	16000	0.621	2190
42	1C	1.14	29.2	1100	7.89	9000	<DL	1150
42	1D	0.956	36.1	22.5	8.76	6960	<DL	883
42	1E	1.34	7.66	3710	3.6	4610	<DL	1080
42	1F	1.81	20.1	49.7	3.59	2560	<DL	1240
42	2A	1.07	211	365	1.37	4520	<DL	1520
42	2B	2.28	444	683	2.84	9220	<DL	1620
42	2C	1.07	36.4	250	5.78	7420	<DL	523
42	2D	1.65	48.2	71.9	8.65	12900	<DL	690
42	2E	1.47	7.82	6080	3.79	4310	<DL	1090
42	2F	1.8	23	121	4.8	3280	<DL	1340
42	3A	0.898	223	350	1.68	4600	<DL	5380
42	3B	1.26	266	231	4.31	6600	<DL	3450
42	3C	0.781	21.1	2550	7.14	7780	<DL	1030
42	3D	1.01	37.8	40.1	9.35	9870	<DL	649
42	3E	1.75	19.1	6630	5.05	6450	<DL	1220
42	3F	1.63	17.8	53.1	3.52	3610	<DL	1300
42	4A	0.386	80.3	72.7	0.5	2330	<DL	556
42	4B	1.2	242	79.5	8.34	10000	<DL	1760
42	4C	0.793	36.9	785	10.4	11800	<DL	961
42	4D	0.82	45.1	25.2	10.5	6410	<DL	868
42	4E	1.47	6.22	6700	3.19	3390	<DL	1200
42	4F	1.64	19.4	30.5	3.22	2770	<DL	1360
42	5A	0.274	52.5	80.5	0.231	2060	<DL	206
42	5B	2.03	454	318	5.55	16600	<DL	1980
42	5C	0.724	26.7	1350	7.26	8110	<DL	643
42	5D	0.77	39	14.8	9.42	6260	<DL	611
42	5E	1.41	11.8	4090	4.23	4220	<DL	1130
42	5F	1.67	19.8	25.7	3.34	2860	<DL	1330
42	6A	0.758	128	193	1.08	3390	<DL	5450
42	6B	1.85	451	186	8.91	13800	<DL	5590
42	6C	0.929	48.5	195	15.1	12300	<DL	1490

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
42	6D	1.01	63.5	73.8	7.61	6300	<DL	809
42	6E	1.49	10.6	3530	3.85	5550	<DL	1370
42	6F	1.64	17.9	28.5	3.46	2760	<DL	1320
42	BCAL	0.324	<DL	63.7	0.145	2000	<DL	231
42	BDOL	0.283	<DL	21.4	0.821	125	<DL	2830
42	R2	0.237	6.3	<DL	<DL	747	<DL	10.1
47	1A	1.935	470	270	3.65	25250	n.d.	3775
47	1B	2.04	1090	355	7.6	13500	<DL	2900
47	1C	1.14	28.5	908	7.52	12600	<DL	1220
47	1D	0.875	35.6	35.2	8.99	7000	<DL	904
47	1E	1.35	8.23	3800	3.81	3700	<DL	1070
47	1F	1.72	19.4	40.4	4.02	3150	<DL	1220
47	2A	0.863	267	350	3.07	5100	<DL	3270
47	2B	1.87	522	425	4.61	10100	<DL	2820
47	2C	1.04	34	177	6.23	10100	<DL	590
47	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
47	2E	1.41	8.84	5950	4	6370	<DL	1070
47	2F	1.71	25.1	125	5.69	3150	<DL	1300
47	3A	0.737	122	194	0.907	6220	<DL	5020
47	3B	1.22	315	226	5.2	7350	<DL	4610
47	3C	0.786	21	1620	7.04	9570	<DL	1210
47	3D	1.28	47.3	34.2	9.99	9590	<DL	850
47	3E	1.75	31.9	1210	6.36	10100	<DL	1250
47	3F	1.57	17.4	33.5	3.68	3570	<DL	1270
47	4A	0.287	84.1	47.7	0.59	1320	<DL	634
47	4B	1.12	390	67.9	10.3	9660	<DL	2390
47	4C	0.705	37.5	617	10.7	8530	<DL	1190
47	4D	0.795	50.2	37.6	10.9	6770	<DL	1090
47	4E	1.47	6.8	6660	3.29	4000	<DL	1150
47	4F	1.5	19.3	22.8	3.38	2780	<DL	1370
47	5A	0.306	46.3	69.2	0.231	2400	<DL	351
47	5B	2.08	795	313	10.2	17400	<DL	4010
47	5C	0.656	24.4	1010	7.27	8070	<DL	651
47	5D	0.825	46.3	28.6	9.09	6680	<DL	750
47	5E	1.47	13.1	3890	4.32	3760	<DL	1160
47	5F	1.76	20.6	29	3.95	3760	<DL	1450
47	6A	0.896	156	214	1.36	2910	<DL	6360
47	6B	2.01	638	183	12.2	15200	<DL	8150
47	6C	1.12	51.5	719	16.5	10200	<DL	1900
47	6D	1.14	53.6	48.8	6.71	7540	<DL	892
47	6E	1.64	11.9	3620	4.43	5420	<DL	1420
47	6F	1.66	21.2	21.1	4.14	3050	<DL	1360

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
47	BCAL	0.466	<DL	60.2	<DL	1150	<DL	239
47	BDOL	0.334	<DL	9.98	0.582	415	<DL	2740
47	R3	0.32	6.41	<DL	<DL	513	<DL	7.92
49	1A	0.644	187	172	1.1	4960	0.554	1240
49	1B	1.72	993	340	6.01	19000	1.84	2690
49	1C	0.871	29.8	763	8.29	11400	0.733	1430
49	1D	0.863	39.8	22.9	10.5	7950	1.57	1240
49	1E	1.16	7.84	3960	3.68	4060	1.12	1090
49	1F	1.42	20.2	54.3	3.99	2880	0.982	1250
49	2A	0.692	252	294	2.49	3780	0.947	2590
49	2B	1.52	511	423	4.17	8390	1.36	2790
49	2C	0.784	34.6	258	5.87	9820	1.08	694
49	2D	0.949	43.2	24.7	10.8	10200	1.41	953
49	2E	1.18	7.83	5990	3.86	4000	0.545	1050
49	2F	1.44	24.6	160	5.38	3350	0.88	1340
49	3A	0.734	187	308	0.852	5600	1.08	3800
49	3B	1.11	277	198	3.63	13900	1.85	4030
49	3C	0.675	23.8	1840	7.36	7720	1.55	1550
49	3D	0.903	54.1	36.5	11.8	8050	2.13	1220
49	3E	1.67	35.3	1250	6.82	6740	1.13	1290
49	3F	1.48	19.5	40.2	4.16	4790	1.2	1350
49	4A	0.375	91.4	71	0.493	1850	1.37	522
49	4B	1.09	402	73.1	8.12	8930	2.42	2200
49	4C	0.602	40.9	627	11.6	8680	1.55	1430
49	4D	0.598	51.9	27.9	10.9	7630	2.09	1360
49	4E	1.36	6.89	6770	3.88	4060	1.16	1220
49	4F	1.25	17.6	18.8	3.21	3060	0.95	1350
49	5A	0.286	76	112	0.21	3000	0.864	367
49	5B	1.73	919	281	10.1	18000	2.21	4980
49	5C	0.743	29.3	1310	9.34	9850	1.35	912
49	5D	0.663	48.4	22.3	10.3	7590	1.59	893
49	5E	1.2	12.5	3890	4.02	4350	0.838	1060
49	5F	1.47	19.2	25.1	3.68	3100	1.06	1350
49	6A	0.845	165	269	1.17	10400	1.08	5200
49	6B	1.6	586	176	9.61	12800	2.16	8000
49	6C	0.725	53.9	735	16.7	10600	1.49	2920
49	6D	0.984	55	47.2	7.8	8690	2.13	1240
49	6E	1.46	11.1	3580	3.91	3630	1.2	1480
49	6F	1.44	18.4	17.9	3.9	3050	1.04	1380
49	BCAL	0.307	<DL	52.9	<DL	989	1.18	173
49	BDOL	0.192	<DL	10.6	0.751	306	0.715	2810
49	R4	0.0964	17.9	<DL	<DL	719	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
53	1A	0.839	196	251	1.03	3860	0.715	1130
53	1B	1.95	951	379	5.43	11200	2.88	2490
53	1C	1.06	31.5	593	7.92	15900	0.954	1570
53	1D	0.797	48.9	17.9	9.15	8350	1.87	1280
53	1E	1.25	7.85	4150	3.64	4080	1.54	1030
53	1F	1.56	22.5	38.5	4.16	3980	1.76	1250
53	2A	0.727	256	279	2.35	4020	1.14	2590
53	2B	1.64	570	387	4.68	8630	1.78	3290
53	2C	0.912	33.4	224	5.98	9010	2	913
53	2D	0.897	56.1	33.2	9.37	11300	<DL	899
53	2E	1.32	8.26	6050	4.36	4120	<DL	1040
53	2F	1.48	28.6	109	6.11	3910	0.486	1290
53	3A	0.786	211	365	1.19	3130	<DL	4430
53	3B	1.06	276	219	3.87	5890	0.875	4200
53	3C	0.673	25.7	1350	7.74	11800	0.532	1760
53	3D	0.811	76.2	27.9	12.4	8080	1.38	1370
53	3E	1.4805	31.8	1147.5	7.17	6810	n.d.	1318.5
53	3F	1.34	21.8	23.6	4.28	4470	<DL	1310
53	4A	0.452	166	118	1.24	7440	<DL	1070
53	4B	1.11	528	62.3	9.64	13800	1.48	2450
53	4C	0.56	42	452	11.7	9510	0.704	1470
53	4D	0.562	59.6	15	12.6	7670	1.03	1540
53	4E	1.25	6.49	6660	3.45	3470	<DL	1190
53	4F	1.23	21.7	12.4	3.92	3600	<DL	1340
53	5A	0.304	91.3	113	0.4	7390	<DL	798
53	5B	1.82	1310	286	13.7	15400	2.02	6320
53	5C	0.713	33.5	972	10.7	12700	0.768	1180
53	5D	0.641	66.7	14	13.8	9180	1.1	1310
53	5E	1.12	12.3	3680	4.48	3700	<DL	1030
53	5F	1.35	22.7	11.2	4.38	3320	<DL	1380
53	6A	0.612	183	275	1.09	3990	<DL	5290
53	6B	1.64	682	163	9.72	11400	1.21	8180
53	6C	0.691	60.6	692	18.6	11100	0.642	3930
53	6D	0.661	55.3	23.6	7.69	8220	<DL	1350
53	6E	1.13	11.7	3350	4.24	3470	<DL	1410
53	6F	1.23	20.6	6.52	4.82	3360	<DL	1300
53	BCAL	0.149	<DL	33.9	<DL	3970	<DL	173
53	BDOL	0.0978	<DL	<DL	0.501	308	<DL	2410
53	R5	0.0824	7.94	<DL	<DL	501	<DL	<DL
56	1A	1.01	229	368	1.66	3090	<DL	1240
56	1B	1.77	994	445	6.25	8770	0.838	2430
56	1C	1.03	30.9	738	9.81	18700	<DL	1880

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
56	1D	0.938	43.6	12.9	13.8	12200	<DL	1520
56	1E	1.26	7.55	5600	4.62	4830	<DL	1050
56	1F	1.59	22	27.3	5.92	3450	<DL	1130
56	2A	0.824	241	359	2.55	3950	<DL	2180
56	2B	1.66	578	520	5.46	7070	<DL	3180
56	2C	0.903	36	207	8.53	6320	<DL	845
56	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
56	2E	1.35	9.11	8830	5.4	4350	<DL	1070
56	2F	1.65	29.2	195	8.46	4530	<DL	1210
56	3A	1.23	274	679	1.62	17500	<DL	4810
56	3B	1.2	302	231	4.14	9740	<DL	4170
56	3C	0.721	27.3	1830	9.18	8000	<DL	2260
56	3D	1.08	86.1	41.6	15.7	8020	<DL	2000
56	3E	1.68	30	9435	7.83	11115	n.d.	1375.5
56	3F	1.45	20.2	20.9	5.66	4860	<DL	1210
56	4A	0.466	175	111	1.34	2590	<DL	1050
56	4B	1.18	603	78.6	10.7	11400	<DL	2350
56	4C	0.713	42.2	594	13.9	18000	<DL	1750
56	4D	0.691	58.6	9.72	14.7	7230	<DL	1820
56	4E	1.35	7.26	9580	4.09	7520	<DL	1130
56	4F	1.28	20.9	4.63	5.07	3380	<DL	1370
56	5A	0.384	84.1	131	0.529	10000	<DL	787
56	5B	1.92	1590	403	17.1	12500	<DL	7030
56	5C	0.729	35.2	1670	14.8	10200	<DL	1510
56	5D	0.823	71.8	17.6	18.9	9080	<DL	1770
56	5E	1.27	13.3	5460	5.92	3470	<DL	1080
56	5F	1.43	20.7	4.53	5.4	3450	<DL	1270
56	6A	1.01	184	360	1.7	7480	<DL	5220
56	6B	1.72	748	201	9.89	10200	<DL	7650
56	6C	0.89	61.7	1010	21.2	9640	<DL	4760
56	6D	0.888	51.8	24.2	8.68	8070	<DL	1580
56	6E	1.41	11.2	4840	5.37	3150	<DL	1450
56	6F	1.45	18.9	<DL	6.26	3490	<DL	1280
56	BCAL	0.275	<DL	45.9	<DL	351	<DL	209
56	BDOL	0.208	<DL	<DL	0.71	512	<DL	2460
56	R6	0.133	8.07	<DL	<DL	351	<DL	12.4
60	1A	1.12	214	305	1.64	16400	<DL	1170
60	1B	1.87	960	424	6.02	8650	<DL	2340
60	1C	0.994	30.5	598	9.92	9280	<DL	2040
60	1D	1.03	58.5	32.4	15.7	8460	<DL	1830
60	1E	1.28	7.72	5520	5.05	4370	<DL	1040
60	1F	1.59	22.2	9.46	6.38	4150	<DL	1140

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
60	2A	0.855	223	431	2.42	9320	<DL	1940
60	2B	1.65	572	513	5.85	7370	<DL	3270
60	2C	0.896	31.1	307	8.18	8130	<DL	1410
60	2D	1.695	66.9	138.15	18	9195	n.d.	1680
60	2E	1.33	9.51	8330	5.66	5370	<DL	1070
60	2F	1.66	32.3	123	9	3940	<DL	1160
60	3A	1.05	224	517	1.29	5690	<DL	4080
60	3B	1.17	302	202	4.14	4580	<DL	4260
60	3C	0.714	30.5	1500	9.54	7520	<DL	2540
60	3D	1.09	94.9	69.3	13.7	9400	<DL	2150
60	3E	1.725	32.55	669	9.57	10980	n.d.	1432.5
60	3F	1.42	20.6	7.91	6.47	4530	<DL	1170
60	4A	0.685	210	162	1.88	6270	<DL	1210
60	4B	1.27	715	75	11.3	9470	<DL	2390
60	4C	0.711	46.2	523	15.1	8560	<DL	2000
60	4D	0.72	78	12.3	15.8	7090	<DL	1990
60	4E	1.32	7.99	9120	4.36	3620	<DL	1110
60	4F	1.25	19.7	<DL	5.56	3500	<DL	1330
60	5A	0.51	124	215	0.777	15500	<DL	1090
60	5B	2	1540	411	16.6	14600	<DL	6730
60	5C	0.786	42.4	1770	16.5	11000	<DL	2310
60	5D	0.84	88.9	33	21.3	9690	<DL	2400
60	5E	1.29	15.5	4960	6.49	6220	<DL	1120
60	5F	1.44	27.3	4.97	6.38	3450	<DL	1290
60	6A	1.03	197	390	1.64	10500	<DL	6280
60	6B	1.73	831	197	9.94	10600	<DL	7480
60	6C	0.905	68.5	944	20.7	9170	<DL	5190
60	6D	0.883	48.4	23.5	8.1	8180	<DL	1800
60	6E	1.41	12.3	4710	5.59	3600	<DL	1440
60	6F	1.36	20.2	<DL	6.86	4130	<DL	1280
60	BCAL	0.275	<DL	37.7	<DL	932	<DL	169
60	BDOL	0.223	<DL	<DL	0.593	84.8	<DL	2540
60	R1	0.164	2.6	<DL	<DL	279	<DL	14
63	1A	0.872	223	436	1.53	6040	0.77	1160
63	1B	1.74	837	523	5.25	9380	2.1	2140
63	1C	0.88	29.1	545	8.91	12800	0.839	2120
63	1D	0.861	69.8	13.4	16.1	7750	1.72	2220
63	1E	1.15	7.33	5540	4.74	4640	0.495	1050
63	1F	1.43	27.9	<DL	6.42	3510	0.872	1170
63	2A	0.493	195	329	1.6	2390	0.516	1350
63	2B	1.54	549	542	5.51	8470	1.31	3280
63	2C	0.796	32.9	245	7.95	13500	1.1	1770

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
63	2D	0.957	157	159	13.9	9310	1.24	2580
63	2E	1.27	9.9	8390	5.94	5990	0.511	1110
63	2F	1.55	41.5	97.3	9.45	4160	0.931	1190
63	3A	0.818	215	512	1.14	2620	0.915	4600
63	3B	1.08	322	186	3.67	6020	1.69	4260
63	3C	0.713	36.4	1550	8.92	7690	1.42	2870
63	3D	0.91	127	22.9	11.8	9480	2.1	2590
63	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
63	3F	1.36	23.5	6.27	6.3	5710	0.968	1190
63	4A	0.587	216	191	1.51	8200	1.04	1120
63	4B	1.23	772	73	9.8	8570	2.46	2390
63	4C	0.714	64.9	542	15.7	9320	1.64	2390
63	4D	6.02	121	35	16.4	7790	1.91	2310
63	4E	5.19	9.46	9400	4.5	4430	0.618	1200
63	4F	27.2	34.8	127	6.04	4210	0.906	1360
63	5A	6.03	138	199	0.578	18600	0.505	995
63	5B	8.53	1330	404	12.9	16100	2.41	5660
63	5C	6.35	50.4	1930	17.8	12800	1.48	3580
63	5D	7.01	116	53.5	22	9120	2.05	3060
63	5E	6.26	15.6	4740	6.33	4730	0.752	1150
63	5F	6.44	31.1	36.1	6.6	3740	1.08	1300
63	6A	1.37	202	401	2.21	3350	0.704	5300
63	6B	2.21	895	245	8.89	8900	2.13	7290
63	6C	1.38	69	909	17.2	9630	1.8	5410
63	6D	1.34	44.6	9.23	6.95	7060	1.26	2140
63	6E	1.76	11.3	4730	5.36	4130	0.652	1480
63	6F	1.74	23.7	<DL	7.11	3950	0.827	1310
63	BCAL	0.705	<DL	36.9	<DL	2440	0.514	166
63	BDOL	0.565	<DL	<DL	0.622	339	<DL	2650
63	R2	0.474	<DL	<DL	<DL	305	<DL	<DL
67	1A	1.05	158	230	1.06	2380	0.572	958
67	1B	2.25	870	534	5.75	14600	2.24	2260
67	1C	1.43	29.9	467	8.07	14800	0.99	1970
67	1D	1.45	80.6	21.4	15.6	7620	2.22	2380
67	1E	1.52	8.12	4910	4.7	3920	0.784	1050
67	1F	1.87	24.2	<DL	6.53	3800	1.17	1150
67	2A	1.07	208	369	1.7	1910	0.901	1440
67	2B	2.03	511	529	5.44	7310	1.58	3210
67	2C	1.3	32.7	205	7.68	8360	1.26	1910
67	2D	1.74	110	163	19.2	11300	1.83	2970
67	2E	1.59	9.99	7530	6.12	5420	0.738	1150
67	2F	1.96	35.8	66.4	9.24	4100	1.18	1170

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
67	3A	1.24	201	451	1.13	3890	0.912	4870
67	3B	1.58	300	190	3.81	4570	1.61	4250
67	3C	1.12	43.3	1350	8.98	5990	1.43	3040
67	3D	1.67	145	64.7	12.7	7240	2.39	3070
67	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
67	3F	1.79	20.9	<DL	6.14	5670	1.09	1200
67	4A	1.1	221	208	1.82	2560	1.1	1250
67	4B	1.78	732	70.6	9.05	8010	2.46	2260
67	4C	1.2	65.1	503	15.6	10700	1.82	2520
67	4D	1.32	112	53	18.2	7480	2.46	2660
67	4E	1.74	10.8	8920	4.7	3990	0.604	1200
67	4F	1.56	25.3	<DL	6.74	3960	0.963	1400
67	5A	0.913	120	165	0.546	14400	0.753	989
67	5B	2.3	1200	362	11.4	15300	2.39	4770
67	5C	1.29	49.6	1510	16.9	10700	1.55	4130
67	5D	1.4	126	52.4	21.8	8790	2.4	3600
67	5E	1.71	21.5	4690	6.17	4670	<DL	1280
67	5F	1.79	34.5	39.4	7.33	3850	<DL	1380
67	6A	1.3	189	283	3.08	6140	<DL	5500
67	6B	2.15	1050	272	8.13	7520	<DL	6970
67	6C	1.48	120	998	18.6	9340	<DL	6480
67	6D	0.749	51	71.6	6.15	6170	<DL	2370
67	6E	1.87	15	4770	5.19	3700	<DL	1530
67	6F	1.72	26.3	30.9	7.7	4230	<DL	1380
67	BCAL	0.44	<DL	71	0.123	703	<DL	219
67	BDOL	0.355	<DL	15.1	0.552	631	<DL	3000
67	R3	0.365	2.56	<DL	<DL	538	<DL	9.99
70	1A	0.546	161	275	0.764	3320	<DL	794
70	1B	1.74	864	549	5.1	11700	1.78	2570
70	1C	0.885	28.8	463	6.9	8300	<DL	1960
70	1D	0.879	83.4	31.2	13.5	7340	0.652	2450
70	1E	1.19	8.8	4810	4.26	8680	<DL	1100
70	1F	1.32	24.4	<DL	5.86	3590	<DL	1220
70	2A	0.547	213	383	1.47	2050	<DL	1400
70	2B	1.45	463	493	4.35	6690	<DL	2880
70	2C	0.793	33.7	230	6.5	9150	<DL	2090
70	2D	1.14	116	123	17.2	11000	0.469	3240
70	2E	1.21	11.1	7130	5.61	6870	<DL	1230
70	2F	1.42	35.6	80	8.3	4180	<DL	1310
70	3A	0.785	221	537	1.22	12600	<DL	5450
70	3B	0.967	272	161	2.76	6000	<DL	3940
70	3C	0.706	54.7	1270	7.54	7960	<DL	3110

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
70	3D	0.97	126	51.1	9.65	5760	0.858	3360
70	3E	1.59	26.7	605	7.2	7630	<DL	1250
70	3F	1.22	22.7	<DL	5.63	6070	<DL	1300
70	4A	0.589	224	226	1.61	6590	<DL	1300
70	4B	1.09	556	64.1	6.46	9270	0.696	2070
70	4C	0.623	70.4	514	13.5	12600	<DL	2490
70	4D	0.7	125	38.9	15.1	7440	0.629	2680
70	4E	1.21	11.6	8370	3.98	5660	<DL	1330
70	4F	1.06	23.3	<DL	6.74	4710	<DL	1460
70	5A	0.488	131	196	0.512	32200	<DL	990
70	5B	1.69	1010	343	8.65	16200	0.595	4020
70	5C	0.705	50.7	1310	13.5	12900	<DL	4470
70	5D	0.828	126	73.3	17.9	8110	0.675	3970
70	5E	1.2	19.6	4540	6.33	5590	<DL	1380
70	5F	1.23	28.7	6.32	7.32	4520	<DL	1410
70	6A	0.581	131	268	0.98	3370	<DL	4470
70	6B	1.46	770	211	6.38	6550	0.466	5940
70	6C	0.765	95	674	13.2	8010	0.444	5230
70	6D	0.692	41	22.4	5.25	6520	<DL	2460
70	6E	1.45	13.1	4630	4.69	5250	<DL	1550
70	6F	1.07	27.5	20.1	7.62	4800	<DL	1350
70	BCAL	<DL	<DL	56.3	<DL	590	<DL	204
70	BDOL	<DL	<DL	17.4	0.457	631	<DL	2540
70	R4	<DL	9.47	11.8	<DL	456	<DL	62.8
74	1A	0.612	183	346	1.01	3580	<DL	908
74	1B	1.33	713	485	3.41	6600	<DL	1950
74	1C	0.879	32.6	485	8.29	8330	<DL	2130
74	1D	0.884	103	67.8	14.8	6050	<DL	2450
74	1E	1.13	10	4710	4.86	4410	<DL	1080
74	1F	1.29	23.6	27.7	6.42	3610	<DL	1180
74	2A	0.545	219	412	1.66	2450	<DL	1370
74	2B	1.4	479	620	4.42	5690	<DL	2660
74	2C	0.686	34.9	244	6.54	6750	<DL	2030
74	2D	1.52	122	366	18.9	11000	<DL	3410
74	2E	1.1	13.3	6910	6.7	4820	<DL	1240
74	2F	1.43	35.3	78.9	9.2	4290	<DL	1260
74	3A	0.601	195	438	1.11	1940	<DL	4770
74	3B	0.978	265	196	3	3750	<DL	3910
74	3C	0.658	57.3	1160	8.04	5400	<DL	3100
74	3D	0.986	107	86.4	9.47	9750	<DL	3370
74	3E	1.44	30.6	325	8.58	5870	<DL	1140
74	3F	1.16	21.2	25.8	7.05	5110	<DL	1290

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
74	4A	0.698	238	266	2.01	8570	<DL	1320
74	4B	1.12	565	85.9	6.96	6680	<DL	1960
74	4C	0.377	59.8	315	4.85	6770	<DL	1700
74	4D	0.738	141	72	16.4	6350	<DL	2620
74	4E	1.19	13.6	8370	4.71	8780	<DL	1310
74	4F	1.06	23.8	27.2	8.69	4070	<DL	1540
74	5A	0.479	130	232	0.571	8130	<DL	967
74	5B	1.6	920	373	8.52	13400	<DL	3710
74	5C	0.668	51.7	1200	13.8	9370	<DL	4640
74	5D	0.871	136	111	18.5	7000	<DL	3960
74	5E	1.16	24	4360	7.67	4430	<DL	1370
74	5F	1.18	25.7	25.3	9.56	4160	<DL	1460
74	6A	0.905	203	457	2.21	5250	<DL	5810
74	6B	1.47	769	231	6.65	6500	<DL	5360
74	6C	0.756	104	621	13.8	7180	<DL	4900
74	6D	0.757	42.4	40.9	5.9	10400	<DL	2700
74	6E	1.26	16.1	4500	5.55	4200	<DL	1530
74	6F	1.12	21.9	18.6	8.89	4500	<DL	1370
74	BCAL	0.15	<DL	51.6	<DL	1230	<DL	184
74	BDOL	0.089	<DL	7.77	0.479	216	<DL	2740
74	R5	<DL	6.96	<DL	<DL	512	<DL	<DL
77	1A	0.645	151	299	0.822	2250	0.544	751
77	1B	1.7	740	501	4.99	10600	2.25	2440
77	1C	0.836	30.2	430	7.42	8280	0.725	2030
77	1D	1.04	109	70.1	14.5	8850	1.83	2340
77	1E	1.1	8.91	4190	5.26	3520	0.602	1110
77	1F	1.26	21.2	<DL	6.78	3530	0.706	1130
77	2A	0.621	211	394	1.6	2220	<DL	1290
77	2B	1.4	404	509	3.92	4580	0.911	2300
77	2C	0.755	36.3	232	6.68	6120	0.709	2120
77	2D	1.34	144	196	18.1	11400	1.52	3350
77	2E	1.13	13.5	6260	7.25	4410	<DL	1230
77	2F	1.48	37.7	58.1	9.54	5180	0.813	1220
77	3A	0.628	178	383	0.954	1690	0.592	4130
77	3B	0.998	246	153	2.58	2780	1.17	3550
77	3C	0.763	53	1010	7.25	4380	1.21	3060
77	3D	1.13	109	42.9	8.44	11300	1.78	3140
77	3E	1.48	33.8	186	8.68	4600	0.685	1060
77	3F	1.28	24.3	5.12	7.89	4560	0.907	1260
77	4A	0.998	292	286	2.43	3380	1.39	1470
77	4B	1.13	541	58.9	5.65	4930	1.82	1730
77	4C	0.694	90.5	493	13.3	6090	1.63	2220

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
77	4D	0.792	149	33.7	15.6	5630	2.05	2400
77	4E	1.19	12.3	7430	5.06	3060	<DL	1260
77	4F	1.04	27.3	<DL	9.89	5410	0.808	1570
77	5A	0.542	160	230	0.579	10900	<DL	958
77	5B	1.54	837	323	7.5	5610	1.66	3280
77	5C	0.739	50.7	1080	13	7760	1.12	4660
77	5D	0.879	144	63.5	17.2	7990	2.03	3770
77	5E	1.15	23.6	4070	8	4810	0.454	1360
77	5F	1.22	29.9	<DL	10.2	4110	0.513	1400
77	6A	0.754	160	320	1.77	3070	<DL	4240
77	6B	1.49	640	198	5.79	4550	1.38	4860
77	6C	0.791	86.1	495	13.1	5770	1.65	4690
77	6D	0.702	41.1	13.1	5.43	5420	0.641	2700
77	6E	1.28	15.7	4400	5.72	3000	<DL	1540
77	6F	1.11	23.8	<DL	9.22	4990	<DL	1380
77	BCAL	0.185	<DL	22.9	<DL	1010	<DL	171
77	BDOL	0.0886	<DL	<DL	0.408	234	<DL	2250
77	R6	0.159	8.16	<DL	<DL	318	<DL	<DL
82	1A	0.726	201	343	1.28	1940	<DL	1080
82	1B	1.86	851	511	6.19	7000	2.22	2860
82	1C	0.887	33.5	445	7.89	6960	0.586	2080
82	1D	1.16	116	111	12.9	5210	1.89	2210
82	1E	1.12	10.8	3730	5.52	4460	0.504	1120
82	1F	1.27	24.4	<DL	7.06	3380	0.829	1170
82	2A	0.609	218	375	1.64	1400	0.428	1330
82	2B	1.44	445	537	4.72	4990	1.39	3010
82	2C	0.889	41	211	7.03	6250	0.882	2260
82	2D	2.07	195	373.5	17.85	8565	1.83	3405
82	2E	1.19	18.4	5820	8.18	4540	0.41	1270
82	2F	1.45	42	33.3	9.95	3810	0.71	1220
82	3A	0.638	181	326	0.967	1550	<DL	4930
82	3B	0.989	241	139	2.74	2670	0.887	3680
82	3C	0.721	53.2	814	7.16	4300	1.06	3010
82	3D	1.12	121	93.8	7.24	5400	1.46	3220
82	3E	1.43	36.2	126	8.6	5240	<DL	1020
82	3F	1.23	32.5	<DL	9.14	4440	0.633	1320
82	4A	0.49	198	143	1.44	1780	0.528	1070
82	4B	1.19	560	56.6	7.77	4490	1.8	1780
82	4C	0.703	97.9	463	12.3	5680	1.48	2030
82	4D	1.32	149	32.6	14.5	5630	1.91	2230
82	4E	1.18	14.5	6710	4.81	3240	<DL	1280
82	4F	1.01	37.1	<DL	11	4040	0.582	1600

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
82	5A	0.544	111	181	0.546	8200	0.864	2280
82	5B	1.48	780	285	6.9	7810	1.62	2780
82	5C	0.755	61.8	937	11.7	6910	1.04	4410
82	5D	0.893	146	62.4	15.1	5450	1.84	3580
82	5E	1.18	28.7	3460	7.57	3360	0.406	1340
82	5F	1.26	38.3	<DL	11	4090	0.59	1430
82	6A	0.871	141	29.8	3.84	2660	0.625	4950
82	6B	1.53	653	178	5.47	4970	1.4	4480
82	6C	0.768	101	345	11.3	4960	1.46	3840
82	6D	0.688	49.9	18.3	5.08	4680	0.632	2640
82	6E	1.29	19.6	4360	6.37	2840	<DL	1520
82	6F	1.07	31.6	<DL	10.5	4490	<DL	1460
82	BCAL	0.243	<DL	16.6	<DL	1530	<DL	158
82	BDOL	0.148	<DL	<DL	0.369	216	<DL	2360
82	R1	0.095	2.41	<DL	<DL	132	<DL	<DL
84	1A	0.73	226	315	0.923	2690	<DL	812
84	1B	1.73	847	350	4.36	7890	1.14	2450
84	1C	0.775	36.8	368	7.5	7550	<DL	2370
84	1D	1.25	126	55.3	12.8	5310	0.445	2430
84	1E	1.1	11.3	3050	5.58	4560	<DL	1230
84	1F	1.26	24.9	23.4	7.28	3890	<DL	1210
84	2A	0.58	225	311	1.23	2900	<DL	1290
84	2B	1.48	431	417	3.37	8580	<DL	2510
84	2C	0.766	47	175	6.86	8970	<DL	2610
84	2D	1.19	227	164	13.1	7610	<DL	3030
84	2E	1.13	18.7	5850	7.95	6270	<DL	1390
84	2F	1.43	47	75.2	10.1	5530	<DL	1300
84	3A	0.765	219	359	0.942	3740	<DL	4990
84	3B	0.923	313	138	2.23	9170	<DL	3830
84	3C	0.604	57.8	638	6.42	5170	<DL	3520
84	3D	0.952	107	61.8	7.11	8630	<DL	4030
84	3E	1.39	38.2	75.5	8.02	6500	<DL	1030
84	3F	1.27	39.1	36.6	9.87	5350	<DL	1480
84	4A	0.581	281	201	1.51	2520	<DL	1330
84	4B	1.05	544	74.9	4.56	6640	<DL	1820
84	4C	0.625	116	469	11.6	6990	<DL	2300
84	4D	0.709	156	68.3	13.6	6410	<DL	2440
84	4E	1.14	13.2	6020	5.02	5640	<DL	1480
84	4F	1.05	41.9	36.4	11.5	5130	<DL	1890
84	5A	0.611	189	300	0.568	20600	<DL	947
84	5B	1.62	754	277	5.23	25700	<DL	2480
84	5C	0.817	68.3	781	9.81	11900	<DL	4640

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
84	5D	0.959	157	106	13.8	6340	<DL	3780
84	5E	1.22	29.9	2670	7.31	5930	<DL	1650
84	5F	1.17	40.7	35.5	10.7	4790	<DL	1670
84	6A	1.07	200	305	1.46	2800	<DL	5720
84	6B	1.6	650	156	4.19	7050	<DL	4490
84	6C	0.895	98.7	310	9.47	6210	<DL	4240
84	6D	0.796	50.2	48.7	4.94	5630	<DL	3170
84	6E	1.42	19.6	3980	5.51	5480	<DL	1850
84	6F	1.2	32.2	38.4	10.1	6030	<DL	1860
84	BCAL	0.282	<DL	79.3	0.135	456	<DL	181
84	BDOL	0.133	<DL	35	0.448	310	<DL	2970
84	R2	0.0988	<DL	10.2	<DL	116	<DL	<DL
88	1A	0.938	288	283	1.39	6180	<DL	1310
88	1B	1.82	734	313	4.09	8200	<DL	2280
88	1C	0.922	41.5	366	7.79	8390	<DL	2450
88	1D	1.19	134	104	12.6	7230	<DL	2640
88	1E	1.13	14.1	2440	6.21	5880	<DL	1430
88	1F	1.3	25.9	37.9	7.6	5580	<DL	1280
88	2A	0.738	240	303	1.59	3100	<DL	1660
88	2B	1.46	386	384	2.86	8040	<DL	2090
88	2C	0.891	49.3	177	6.17	6810	<DL	2490
88	2D	2.505	198	558	14.955	6525	n.d.	3495
88	2E	1.28	26	5810	8.58	6730	<DL	1630
88	2F	1.55	52.7	61	9.73	4890	<DL	1390
88	3A	0.736	203	296	1.1	4260	<DL	6270
88	3B	1.08	327	140	2.37	5970	<DL	4280
88	3C	0.826	57.4	484	6.19	6170	<DL	3740
88	3D	1.4685	101.7	136.65	6.69	3990	2.22	4155
88	3E	1.5	38.1	67.6	8	6700	<DL	1160
88	3F	1.46	51.5	59.3	11.1	6030	<DL	1670
88	4A	0.8985	376.5	226.5	2.1	6975	n.d.	1965
88	4B	1.23	558	212	4.55	12300	<DL	1910
88	4C	0.78	98.4	364	9.65	6780	<DL	2140
88	4D	1.04	153	109	12.9	5920	0.948	2540
88	4E	1.36	14.2	5980	5.12	6370	<DL	1750
88	4F	1.25	57.2	62.4	12.3	5210	<DL	2090
88	5A	0.896	189	306	0.71	44700	<DL	1280
88	5B	1.86	764	296	5.3	23000	<DL	2700
88	5C	0.977	68.4	654	8.86	8790	<DL	4220
88	5D	1.1	144	113	11.7	5970	0.491	3420
88	5E	1.34	29.8	2450	7.16	5890	<DL	1810
88	5F	1.45	51.4	58.1	12.1	5230	<DL	1910

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
88	6A	1.19	233	368	1.58	3570	<DL	6940
88	6B	1.65	696	154	4.58	5760	<DL	5040
88	6C	0.868	96.9	275	9.36	8220	<DL	4610
88	6D	0.856	58.9	67.8	4.91	5980	<DL	3370
88	6E	1.53	23.3	4070	5.89	6390	<DL	1980
88	6F	1.35	43.5	54.6	11.1	5670	<DL	2000
88	BCAL	0.336	<DL	101	0.16	7280	<DL	192
88	BDOL	0.242	<DL	47.8	0.369	340	<DL	2950
88	R3	0.179	<DL	23.4	<DL	408	<DL	<DL
91	1A	0.23	508	358	2.99	3880	1.56	2270
91	1B	0.845	664	267	3.47	8010	1.61	1860
91	1C	0.142	51.1	341	7.37	7510	0.682	2150
91	1D	0.202	120	50.9	10.9	4990	1.47	2150
91	1E	0.307	19.4	2260	6.19	5800	<DL	1280
91	1F	0.442	31.1	7.92	7.98	5940	<DL	1190
91	2A	<DL	253	294	1.47	4300	<DL	1410
91	2B	0.591	371	344	2.67	7540	0.669	1720
91	2C	<DL	58	162	5.49	5440	<DL	1980
91	2D	0.9435	303	388.5	18	10620	1.89	4005
91	2E	0.366	30.7	5640	7.93	6450	<DL	1490
91	2F	0.686	58.4	38	9.14	4290	0.798	1150
91	3A	0.393	176	246	0.818	2530	<DL	4460
91	3B	0.541	321	126	2.14	5020	1.34	4030
91	3C	0.278	62.5	480	5.94	5670	1.75	3580
91	3D	0.257	61.5	69.4	3.89	6620	1.28	2550
91	3E	0.975	44	45	7.66	6100	1.05	1070
91	3F	1.19	55.1	43.3	10.9	5150	1.46	1480
91	4A	<DL	298	106	1.48	5150	1.03	1540
91	4B	0.631	549	64.7	4.37	5260	1.98	1720
91	4C	4.43	104	407	8.69	5580	1.51	1800
91	4D	4.5	141	104	10.8	5130	2.12	2010
91	4E	0.691	19.6	5720	4.81	4940	0.624	1560
91	4F	11.6	71.6	95.7	12.4	4510	1.32	1980
91	5A	0.205	177	259	0.717	21200	0.813	1080
91	5B	3.3	681	299	4.65	21600	1.96	2240
91	5C	0.409	69.9	622	7.86	7770	1.26	3490
91	5D	0.301	134	88.3	10.2	4740	2.97	2690
91	5E	1.27	35.2	2560	7.34	5260	0.708	1670
91	5F	1.25	59.1	33.4	11.3	4360	1.29	1660
91	6A	0.746	204	244	1.8	3800	0.994	6480
91	6B	1.23	710	123	4.19	6080	1.7	4740
91	6C	0.664	107	223	8.45	5870	1.9	3860

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
91	6D	0.278	67.2	38.8	4.54	4670	1.16	2910
91	6E	0.845	27	4100	5.49	4260	<DL	1670
91	6F	0.7	52.5	30.7	11.1	5260	1.25	1960
91	BCAL	<DL	<DL	51.1	<DL	2270	<DL	158
91	BDOL	<DL	<DL	13.5	0.342	852	<DL	2430
91	R4	1.12	20.1	<DL	<DL	417	<DL	8.29
95	1A	0.596	502	407	3.2	19000	1.67	2400
95	1B	2.16	717	285	3.9	15600	2.1	2040
95	1C	0.556	60.9	449	7.8	12400	1.03	2280
95	1D	0.631	139	74.8	11.4	16800	2.9	2360
95	1E	0.801	25.9	2080	7.16	9560	1.06	1580
95	1F	1.61	46	38.8	9.64	5420	1.75	1410
95	2A	0.208	250	300	1.7	7330	0.826	1610
95	2B	1.04	387	385	2.76	6410	1.61	1890
95	2C	0.793	65	202	6.09	15200	1.44	2210
95	2D	1.4385	180	453	14.07	37950	2.835	3255
95	2E	1.28	35	5960	8.67	11200	0.969	1760
95	2F	4.08	66.7	70.7	10	4920	1.39	1300
95	3A	0.348	191	282	0.99	3950	0.873	5480
95	3B	0.724	318	140	2.26	13700	1.54	4350
95	3C	0.434	56.9	339	5.68	7560	1.39	3730
95	3D	23.7	92.1	313.5	5.64	9435	1.4355	3705
95	3E	1.05	41.8	40	6.95	6650	0.951	1020
95	3F	1.17	65.2	41.2	11	4910	1.43	1330
95	4A	5.04	403	320	2.28	157000	1.92	1880
95	4B	1.04	578	87.8	4.59	9920	2.1	1830
95	4C	8.88	97.1	475	8.73	13900	6.76	1890
95	4D	0.978	147	88.7	11.1	9000	2.57	2150
95	4E	6.9	20.7	5810	5.33	17200	0.401	1630
95	4F	0.662	68.4	40.1	11.7	5830	1.15	1970
95	5A	4.83	151.5	249	0.654	27000	0.951	1029
95	5B	2.92	665	303	4.53	18200	1.87	2140
95	5C	3.21	68.4	554	6.99	13200	1.25	3070
95	5D	0.568	124	87.6	9.27	5400	2.15	2480
95	5E	5.09	36.5	2270	7.09	10200	0.617	1680
95	5F	4.94	65.7	67.2	11.3	4900	1.2	1670
95	6A	12.405	123.9	148.05	3.045	10230	3.96	4275
95	6B	3.56	728	151	4.71	5810	2.31	5150
95	6C	3	105	238	8.12	9190	2.03	3980
95	6D	11.2	62.9	129	4.47	7510	1.49	3000
95	6E	2.07	27.9	3820	5.58	5840	0.871	1750
95	6F	2.82	64.6	52.2	11.6	5480	1.4	2010

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
95	BCAL	1.62	<DL	75.8	<DL	3850	0.655	158
95	BDOL	1.03	<DL	19.9	0.187	2090	0.565	1860
95	R5	1.33	12.9	9.73	<DL	1530	0.455	7.69
98	1A	1.63	466	536	2.45	13900	0.841	1640
98	1B	2.04	700	361	3.65	6030	1.28	1650
98	1C	1.36	76.6	580	9.38	6970	0.963	2270
98	1D	1.3	151	93.5	11.7	7770	1.07	1960
98	1E	1.55	34.3	2430	8.53	4860	<DL	1580
98	1F	1.61	62.8	45.1	11	3990	<DL	1260
98	2A	1.03	281	428	1.65	2910	<DL	1360
98	2B	1.82	419	483	2.65	5190	<DL	1580
98	2C	1.38	81.6	257	6.74	5950	1.13	2170
98	2D	2.115	220.5	396	13.29	7995	0.822	2580
98	2E	1.63	38.5	6590	9.67	5470	<DL	1670
98	2F	1.93	77.9	75.7	10.5	4790	0.461	1230
98	3A	1.11	238	394	0.983	9270	<DL	4540
98	3B	1.47	354	169	2.39	9030	0.641	3940
98	3C	1.09	69.8	362	6.71	5240	<DL	3580
98	3D	1.65	118.65	146.85	5.745	3210	n.d.	3525
98	3E	1.74	45.5	49.7	8.14	4840	<DL	931
98	3F	1.82	78	58.6	12.8	4960	<DL	1270
98	4A	1.13	365	235	1.78	8100	0.449	1320
98	4B	1.5	585	98	4.53	4390	0.837	1590
98	4C	0.988	118	546	10.1	5020	0.784	1800
98	4D	1.15	178	91.3	12.7	5770	1.64	2050
98	4E	1.57	23.9	6420	6.2	3850	<DL	1540
98	4F	1.59	88.8	55.9	13.9	4970	<DL	1870
98	5A	0.984	198	241	0.643	13900	<DL	873
98	5B	1.98	659	322	4.52	7150	0.592	1760
98	5C	1.01	73.3	543	7.51	6030	<DL	2610
98	5D	1.22	151	102	10.4	5200	0.989	2270
98	5E	1.57	38.8	2630	8.45	4650	<DL	1580
98	5F	1.87	84.8	61.8	13.7	5620	0.477	1670
98	6A	1.25	205	239	2.1	9560	<DL	4230
98	6B	1.94	775	178	5	4780	0.866	4600
98	6C	1.2	120	307	9.74	6280	1.11	4020
98	6D	1.07	79.8	71	1.53	4950	<DL	2670
98	6E	1.82	34.1	4340	6.79	4420	<DL	1600
98	6F	1.71	81.3	61	13.2	5840	<DL	1930
98	BCAL	0.358	<DL	80.3	0.12	1810	<DL	145
98	BDOL	0.502	<DL	42	0.428	2070	<DL	2390
98	R6	0.295	18.9	10.4	<DL	779	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
103	1A	1.56	461	474	2.77	9460	0.486	1690
103	1B	2.18	761	346	4.2	10600	1.09	1770
103	1C	1.41	82.5	552	8.99	11300	<DL	2060
103	1D	1.59	151.5	126.3	12.6	15150	0.771	2325
103	1E	1.48	39.1	1560	9.31	11700	<DL	1680
103	1F	1.74	84.6	51.5	13.1	4810	<DL	1340
103	2A	1.08	295	376	2.02	2570	<DL	1500
103	2B	1.72	387	415	2.81	5440	0.878	1520
103	2C	1.22	74	235	6.59	6330	<DL	1920
103	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
103	2E	1.53	43.4	6080	10.1	7250	<DL	1760
103	2F	1.83	86.4	54.4	10.9	4470	<DL	1190
103	3A	0.905	185	248	1.01	5890	<DL	4450
103	3B	1.39	376	163	2.83	5680	<DL	4440
103	3C	1.04	79.2	50.5	7.19	7790	<DL	3970
103	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
103	3E	1.81	51	55.6	8.81	9310	<DL	1010
103	3F	1.95	99.2	64.6	15.3	4820	<DL	1230
103	4A	1.356	510	270	2.715	16950	n.d.	1845
103	4B	1.51	650	98.7	5.23	6180	0.635	1610
103	4C	0.986	114	490	9.74	6390	0.494	1730
103	4D	1.41	175	134	12.7	6250	1.93	1950
103	4E	1.48	25.7	5610	6.79	6750	<DL	1630
103	4F	1.61	88.7	59.8	14.1	4510	0.596	1900
103	5A	0.92	163	238	0.692	14600	<DL	847
103	5B	2.02	663	319	4.63	11200	0.764	1790
103	5C	1.03	68.2	499	6.94	7070	<DL	2370
103	5D	1.28	138	117	10.3	4680	1.05	2130
103	5E	1.54	39.3	2270	8.45	6160	<DL	1590
103	5F	1.84	90.3	60.6	13.6	4180	<DL	1580
103	6A	1.07	155	146	2.5	3760	<DL	3760
103	6B	1.91	818	181	5.29	7540	0.613	4720
103	6C	1.04	107	315	8.98	5260	<DL	3810
103	6D	1.11	83.1	93.5	5.33	5470	<DL	2850
103	6E	1.84	35.5	3800	6.79	4810	<DL	1540
103	6F	1.87	92	61.1	13.6	4690	<DL	2020
103	BCAL	0.508	<DL	89.3	0.137	8050	<DL	146
103	BDOL	0.436	<DL	31.7	0.308	5060	<DL	2050
103	R1	0.333	<DL	13.9	<DL	3200	<DL	1.34
105	1A	2.87	385	567	2.23	4330	1.23	1630
105	1B	1.4	566	288	3.14	6680	1.92	1660
105	1C	1.03	75.5	573	9.11	7410	2.54	2340

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
105	1D	0.871	135	64	11.9	5310	2.23	2090
105	1E	0.875	32.3	1870	8.37	6530	0.976	1720
105	1F	1.19	69.3	28.6	11.5	4110	1.47	1320
105	2A	0.488	246	370	1.34	2470	0.657	1140
105	2B	1.5	357	431	2.53	4770	1.54	1710
105	2C	0.628	65.2	211	5.68	6040	1.27	1940
105	2D	1.94	185	519	12.1	7880	2	2610
105	2E	0.935	34.8	5420	9.12	6960	0.5	1890
105	2F	1.56	82.6	43.6	11.4	5150	2.14	1450
105	3A	0.545	152	261	0.667	9670	0.712	3560
105	3B	1.1	295	138	2.17	12300	1.63	4490
105	3C	0.542	63.6	21.6	6.55	6450	1.98	4510
105	3D	0.97	97.4	126	6.09	7490	1.83	4750
105	3E	1.18	39.7	24.6	7.28	6750	0.997	932
105	3F	1.28	81.6	33.5	13.6	5510	1.63	1280
105	4A	0.775	396	208	2.43	6340	2.09	1760
105	4B	0.883	478	64.4	3.92	7020	2.07	1630
105	4C	0.574	98.3	518	8.64	6190	1.97	1820
105	4D	0.593	147	44.5	11.2	5000	2.21	2020
105	4E	0.861	21.8	4980	6.23	4520	0.66	1650
105	4F	1.03	75.3	28.7	12.1	4740	1.39	2110
105	5A	0.413	167	200	0.654	2210	0.666	814
105	5B	1.26	468	257	3.39	6060	1.59	1690
105	5C	0.671	62.7	469	6.29	5400	1.43	2480
105	5D	0.605	104	88.3	8.45	4470	1.89	2050
105	5E	0.92	31.9	1970	6.98	6480	1.06	1700
105	5F	1.09	73.1	26.1	11.5	4830	1.24	1630
105	6A	0.566	157	240	1.43	3820	0.67	3100
105	6B	1.23	612	151	4	11100	1.69	4350
105	6C	0.73	102	319	8.76	5660	2.48	4610
105	6D	0.554	68.5	43	4.72	4540	1.22	3120
105	6E	1.08	28.2	3260	5.71	4590	0.648	1630
105	6F	1.08	72.9	29.9	11.2	4740	1.22	2110
105	BCAL	0.0625	<DL	48.6	<DL	5490	<DL	140
105	BDOL	<DL	<DL	<DL	0.28	2170	<DL	2170
105	R2	<DL	<DL	<DL	<DL	470	<DL	<DL
109	1A	0.717	330	341	1.71	21600	0.971	1460
109	1B	1.27	550	290	3.2	10800	1.89	1710
109	1C	0.5955	60	453	7.32	13365	0.813	2220
109	1D	0.972	118	119	10.8	10500	2.72	2020
109	1E	0.886	32.2	1490	8.09	9790	1.21	1880
109	1F	1.21	77.4	29.4	11.2	5630	1.92	1310

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
109	2A	0.493	230	332	1.32	4000	0.893	1230
109	2B	1.16	329	370	2.34	7010	1.34	1670
109	2C	0.692	58.7	201	5.18	16500	1.38	1810
109	2D	2.16	135	540	10.11	4020	2.04	2535
109	2E	0.952	34.6	4890	8.51	8710	0.959	2120
109	2F	1.37	76.1	35.6	9.98	4950	1.59	1260
109	3A	0.296	125	192	0.584	4090	0.654	3460
109	3B	0.805	299	129	2.23	6020	1.4	4630
109	3C	0.525	68.7	25	6.55	10000	1.42	4580
109	3D	0.743	81.4	88.2	5.34	12100	1.27	4280
109	3E	1.09	41.5	21.1	7.38	6200	0.712	904
109	3F	1.28	94.1	33.5	14	5890	1.59	1300
109	4A	0.684	362	200	1.92	3140	2.07	1600
109	4B	0.942	485	71.6	4	6870	2.02	1620
109	4C	0.535	90.8	499	7.88	6340	2.02	1840
109	4D	0.642	138	78.4	10.8	5380	2.39	2060
109	4E	0.879	21.8	4600	6.45	5460	0.675	1690
109	4F	0.931	68.5	27.1	11.4	5540	1.35	2120
109	5A	0.426	153	195	0.5055	18150	0.6105	903
109	5B	1.24	470	256	3.41	6610	1.4	1680
109	5C	0.546	53.8	410	5.59	5350	1.28	2290
109	5D	0.596	95.2	102	7.53	4530	1.88	1940
109	5E	0.941	31.9	1910	6.83	6850	0.954	1730
109	5F	1.12	76	30.4	11	4720	1.48	1680
109	6A	0.668	167	242	1.27	7040	0.752	3650
109	6B	1.27	617	157	4.21	6290	2.02	4770
109	6C	0.601	87.4	279	7.35	4840	1.79	4020
109	6D	0.548	65.3	81.3	4.6	4670	1.47	3360
109	6E	1.08	28.2	2970	5.7	9590	0.736	1640
109	6F	1.06	72.8	26	10.5	4860	1.23	2190
109	BCAL	<DL	<DL	58.9	<DL	1960	<DL	162
109	BDOL	<DL	<DL	10.1	0.211	1250	0.791	2190
109	R3	<DL	2.77	<DL	<DL	809	<DL	<DL
112	1A	3.65	434	440	2.18	13700	<DL	1600
112	1B	1.63	598	296	3.04	6990	0.803	1720
112	1C	0.969	65.2	521	7.22	8330	<DL	1820
112	1D	1.16	134	85.1	10.9	4650	0.901	1960
112	1E	1.12	34	1500	8.24	6400	<DL	1870
112	1F	1.48	85.5	39	11.2	4080	<DL	1260
112	2A	0.682	207	347	1.22	4780	<DL	1090
112	2B	1.35	410	388	3.06	7090	<DL	1960
112	2C	0.854	63.9	210	5.31	6540	<DL	1870

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
112	2D	1.92	143	399	11	15300	<DL	2660
112	2E	1.02	31.9	4390	8.03	6400	<DL	2080
112	2F	1.59	77.6	48.2	9.76	4640	<DL	1250
112	3A	0.501	147	257	0.615	5640	<DL	3580
112	3B	0.968	301	141	2	9510	<DL	4100
112	3C	0.71	73.9	38	6.33	9620	<DL	4600
112	3D	1.02	76.2	91.9	5.34	2820	<DL	4270
112	3E	1.29	42.4	33.7	7.2	7280	<DL	800
112	3F	1.51	91.4	43.5	13.4	5170	<DL	1260
112	4A	0.466	225	127	1.07	5210	<DL	825
112	4B	1.52	537	96.5	4.16	9970	1.15	1860
112	4C	0.781	91.8	536	8.09	6600	<DL	1820
112	4D	0.879	146	74	10.8	5240	0.995	2050
112	4E	1.08	24.1	4240	6.74	8660	<DL	1750
112	4F	1.14	68	40.4	10.8	4740	<DL	1970
112	5A	0.817	183	278	0.501	19500	<DL	1010
112	5B	1.5	457	274	3.16	15300	<DL	1680
112	5C	0.815	56	420	5.45	8260	<DL	2110
112	5D	0.819	103	102	7.54	4490	<DL	1960
112	5E	1.06	29	1740	6.35	6130	<DL	1710
112	5F	1.15	69.8	36.6	9.51	4140	<DL	1530
112	6A	0.865	142	164	2.19	3830	<DL	2880
112	6B	1.43	587	175	3.68	6970	0.481	4240
112	6C	0.715	83.7	299	6.92	6740	<DL	3870
112	6D	0.716	65	100	4.43	4280	<DL	3210
112	6E	1.28	28.3	2750	5.46	4750	<DL	1580
112	6F	1.37	74.2	44.5	10.6	4450	<DL	2260
112	BCAL	0.167	<DL	77.6	<DL	3230	<DL	207
112	BDOL	0.121	<DL	24.4	0.278	141	<DL	2210
112	R4	<DL	11.5	19	<DL	927	<DL	<DL
116	1A	0.924	379	352	2.06	10400	<DL	1570
116	1B	1.51	564	297	3.19	8120	0.442	1730
116	1C	0.895	61.3	488	7.22	11800	<DL	1860
116	1D	1.09	120	103	10.2	6680	<DL	1870
116	1E	1.04	37.2	915	8.75	5170	<DL	2020
116	1F	1.39	84.9	42.4	11.2	4100	<DL	1300
116	2A	0.546	178	273	1.11	3660	<DL	959
116	2B	1.52	335	355	2.42	5930	<DL	1700
116	2C	0.758	60	211	5.5	5680	<DL	1920
116	2D	2.35	113	582	8.41	3240	<DL	2350
116	2E	1.1	32.7	3960	8.36	6290	<DL	2330
116	2F	1.37	75.7	54	3.68	4240	<DL	1240

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
116	3A	0.521	113	206	0.573	4030	<DL	3670
116	3B	0.982	305	142	2.15	6230	<DL	4500
116	3C	0.675	74.5	40.9	6.72	6840	<DL	4890
116	3D	1.06	79.7	97.6	5.76	3140	<DL	4940
116	3E	1.2	43	36	7.57	8670	<DL	814
116	3F	1.61	96.7	50.1	14.2	5540	<DL	1450
116	4A	0.25	150	91	0.795	2060	<DL	609
116	4B	1.11	537	83.1	4.28	5930	<DL	1720
116	4C	0.655	89.5	464	7.89	7720	<DL	1860
116	4D	0.803	129	75	2.76	7250	0.925	2000
116	4E	0.999	23.8	3620	6.62	8290	<DL	1800
116	4F	1.15	65.2	48	4.61	4550	<DL	2090
116	5A	0.858	165	261	0.507	22500	<DL	994
116	5B	1.4	450	258	3.23	9930	<DL	1710
116	5C	0.744	48.8	407	5.23	5110	<DL	2040
116	5D	0.776	92.2	99.1	7.01	3840	0.425	1870
116	5E	1.04	27.9	1490	6.34	7810	<DL	1770
116	5F	1.3	70.8	47.2	9.47	4010	<DL	1670
116	6A	0.701	120	157	1.86	4140	<DL	2600
116	6B	1.33	542	161	3.58	9730	<DL	4210
116	6C	0.689	73.9	291	6.55	6470	<DL	3780
116	6D	0.761	65.7	72.6	1.6	4190	<DL	3260
116	6E	1.18	27.8	2250	5.35	6700	<DL	1580
116	6F	1.21	70.9	41	9.33	4180	<DL	2250
116	BCAL	0.119	<DL	67.3	0.128	3070	<DL	183
116	BDOL	0.0855	<DL	18.2	0.255	3300	<DL	2050
116	R5	<DL	10.8	6.35	<DL	658	<DL	<DL
119	1A	1.01	406	385	2.28	8630	1.17	1720
119	1B	1.48	568	305	3.12	6440	2.08	1810
119	1C	0.921	64.1	529	7.44	8600	1.81	1940
119	1D	0.95	124	83.9	10.3	6100	2.1	2000
119	1E	1.11	36.7	950	8.82	7520	1.09	2230
119	1F	1.46	85.9	30.2	12.1	4890	1.69	1520
119	2A	0.626	203	319	1.11	2500	<DL	1020
119	2B	1.31	328	380	2.16	6200	1.06	1570
119	2C	0.798	61.5	216	5.39	6520	1.3	1900
119	2D	2.23	136	479	10.5	4350	2.21	2700
119	2E	1.15	34	3940	8.82	9820	0.828	2600
119	2F	1.49	84.3	33.8	9.57	4640	1.5	1400
119	3A	0.609	140	229	0.603	3210	0.875	3830
119	3B	1.03	291	134	2.03	10300	1.52	4520
119	3C	0.734	73.1	29.2	6.54	5660	1.77	4920

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
119	3D	1.02	90.2	75.5	5.72	10500	1.77	5200
119	3E	1.26	44.5	25.1	8.07	9180	0.989	844
119	3F	1.49	98	30.7	14.2	5710	1.76	1570
119	4A	0.484	163	116	0.79	15900	0.607	593
119	4B	1.11	496	72.4	3.87	7920	1.97	1680
119	4C	0.695	101	560	8.56	7440	1.99	1950
119	4D	0.81	140	53.3	10.4	5210	2.28	2040
119	4E	0.958	23.9	3300	6.76	8050	<DL	1840
119	4F	1.11	72.1	30.5	10.9	5430	1.19	2170
119	5A	0.576	141	212	0.37	7200	2.06	752
119	5B	1.51	463	273	3.18	12300	1.58	1700
119	5C	0.755	50.3	415	5.15	9310	1.14	2030
119	5D	0.874	95.5	77.7	6.97	5180	1.89	1880
119	5E	1.03	27.6	1480	6.38	7310	0.731	1770
119	5F	1.33	68.4	28.9	9.34	4450	1.22	1730
119	6A	0.9	166	273	1.21	4340	0.418	3080
119	6B	1.32	532	150	3.46	7360	1.55	3960
119	6C	0.638	77.2	269	6.42	6410	1.44	3840
119	6D	0.658	63.9	56.9	4.31	4500	1.31	3560
119	6E	1.13	27.3	2230	5.49	4460	0.468	1620
119	6F	1.32	66.7	28.7	9.34	5000	1.1	2500
119	BCAL	0.188	<DL	52.5	<DL	822	<DL	200
119	BDOL	0.133	<DL	5.57	0.218	1030	<DL	2180
119	R6	<DL	14	<DL	<DL	471	<DL	13.7
123	1A	1.24	546	431	2.8	22500	1.34	2200
123	1B	1.52	596	353	3.45	13200	1.96	1830
123	1C	0.858	61.9	523	7.39	7740	1.08	1840
123	1D	1.31	135	85.2	11.2	6560	3.07	2180
123	1E	1.02	36.3	717	9.21	6110	1.13	2250
123	1F	1.48	99.7	36.9	12.7	5620	1.82	1680
123	2A	0.775	256	386	1.26	4060	0.847	1120
123	2B	1.36	376	378	2.94	6300	1.34	1980
123	2C	0.724	51.1	214	4.85	8370	1.1	1810
123	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
123	2E	1.12	32.7	3550	8.72	9700	0.756	2750
123	2F	1.52	87.3	43.7	9.82	5120	1.46	1490
123	3A	0.575	153	258	0.601	4110	<DL	3810
123	3B	1.02	303	138	2.3	9680	0.989	5010
123	3C	0.762	77.4	39.8	6.94	12000	1.56	5430
123	3D	1.19	94.7	96.5	5.97	11500	1.45	5080
123	3E	1.22	46.2	29.9	8.96	10000	0.655	861
123	3F	1.65	108	38.6	15.4	6020	1.5	1740

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
123	4A	0.553	215	121	1.05	11400	<DL	739
123	4B	1.1	516	74.2	4.07	6980	2	1710
123	4C	0.632	91.2	547	8.64	6100	1.74	1900
123	4D	0.832	136	75.3	10.8	5180	2.77	2100
123	4E	1.03	22.9	3300	7.72	6770	0.482	1950
123	4F	1.15	66.7	33.3	10.7	5700	1.37	2230
123	5A	0.713	161	175	0.449	19000	<DL	854
123	5B	1.52	448	270	3.18	20800	1.55	1740
123	5C	0.755	48.7	455	5.29	7010	1.06	2020
123	5D	0.955	98.8	97.6	6.99	5520	1.66	1830
123	5E	1	27.1	1370	6.06	6510	0.586	1780
123	5F	1.16	69.2	26.5	9	5080	1.02	1650
123	6A	0.781	163	261	1.1	6980	0.407	2810
123	6B	1.35	541	151	3.47	6760	1.39	4120
123	6C	0.768	84.8	288	6.51	10900	1.58	3930
123	6D	0.757	70	80.8	4.34	5120	1.15	3600
123	6E	1.25	29.3	2130	5.88	7310	0.574	1710
123	6F	1.18	66.2	23.1	8.42	5050	0.754	2380
123	BCAL	0.204	<DL	52.2	<DL	4230	<DL	184
123	BDOL	0.0645	<DL	<DL	<DL	852	<DL	1910
123	R1	<DL	2.46	<DL	<DL	501	<DL	15
126	1A	1.36	636	475	3.2	39000	1.65	2130
126	1B	1.55	589	289	3.26	6640	1.67	1750
126	1C	0.886	67.2	528	7.56	6390	0.926	1830
126	1D	1.02	130	75.7	11.2	4740	1.5	1910
126	1E	1.08	42.6	820	9.87	7290	<DL	2250
126	1F	1.51	105	45.8	13.6	5400	0.948	1660
126	2A	0.693	229	361	1.16	2190	<DL	864
126	2B	1.26	361	372	2.56	5540	<DL	1620
126	2C	0.823	62.3	241	5.3	6420	0.517	1790
126	2D	1.46	180	393	8.82	8410	0.846	1870
126	2E	1.18	38.5	3240	9.38	7430	13.6	2720
126	2F	1.45	91.5	59.2	10	5360	2.02	1440
126	3A	0.566	149	259	0.592	4480	<DL	3220
126	3B	1.06	327	150	2.23	6410	0.421	4390
126	3C	0.69	84.7	41.3	6.84	6760	0.704	5060
126	3D	0.901	92.3	122	5.89	6610	1.28	4890
126	3E	1.15	54.5	187	9.35	8750	10.6	851
126	3F	1.75	136	53.4	17.7	6730	0.955	1800
126	4A	0.43	201	158	0.965	4440	<DL	596
126	4B	1.18	521	86.9	3.87	9380	1.43	1570
126	4C	0.755	117	602	9.95	9790	3.03	1900

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
126	4D	0.783	158	185	11.1	5600	5.17	1940
126	4E	1.02	29.6	3070	8.23	9010	<DL	1900
126	4F	1.36	81	61.9	12.6	6440	0.889	2450
126	5A	0.95	200	276	0.566	28800	<DL	960
126	5B	1.47	452	263	2.99	18800	<DL	1640
126	5C	0.743	55.5	494	5.73	6370	<DL	1900
126	5D	0.766	94.2	75	6.79	4660	0.686	1800
126	5E	1.04	31.6	1320	6.69	8230	9.69	1770
126	5F	1.35	76.1	43.6	9.53	5190	<DL	1670
126	6A	0.974	183	401	1.37	6870	0.59	2770
126	6B	1.36	528	165	3.31	14400	2.4	3650
126	6C	0.808	97.2	265	6.83	10800	1.16	3800
126	6D	0.741	68.7	74.5	4.6	4820	0.82	3370
126	6E	1.18	30.8	1920	5.86	8150	<DL	1540
126	6F	1.25	71.2	40.6	8.78	4720	<DL	2400
126	BCAL	0.209	<DL	66.6	0.152	1440	<DL	152
126	BDOL	0.0948	<DL	17.9	0.203	372	<DL	1530
126	R2	<DL	5.72	5.02	<DL	694	<DL	5.56
130	1A	1.19	565	371	2.99	32500	0.491	2030
130	1B	1.6	716	322	4.11	6070	1.26	1860
130	1C	0.942	75.3	579	8.19	11700	0.536	1840
130	1D	1.09	104	145	3.32	4350	0.573	1790
130	1E	1.06	44.8	771	10.4	6230	<DL	2490
130	1F	0.981	71.2	37.6	4.18	3950	<DL	1360
130	2A	0.783	269	380	1.93	3820	<DL	1460
130	2B	1.39	490	528	4.84	8200	1.18	3670
130	2C	0.885	69.5	251	6.18	5940	0.593	1890
130	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
130	2E	1.08	37.2	2720	9.41	7210	<DL	2870
130	2F	1.55	96.8	77.3	10	4730	0.556	1570
130	3A	0.662	175	272	0.829	3910	<DL	4170
130	3B	1.07	346	143	2.42	6310	0.467	4680
130	3C	0.751	94.7	49.4	7.23	7330	0.723	5570
130	3D	1.05	85.6	73	3.49	19500	0.408	5070
130	3E	1.14	58.5	43.3	10.3	10200	0.937	960
130	3F	1.01	75.5	33	8.58	4010	<DL	1450
130	4A	0.511	222	126	1.11	3050	<DL	728
130	4B	1.26	546	88.8	4.14	6200	1.22	1620
130	4C	0.984	107	565	9.29	7960	1.08	1850
130	4D	0.84	142	81.7	2.45	5040	2.04	1930
130	4E	1.14	29	2610	7.94	7650	0.949	1910
130	4F	0.517	49.4	26.1	3.02	2440	<DL	1190

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
130	5A	0.994	177	233	0.692	5040	0.564	967
130	5B	1.54	466	280	2.98	15000	1.11	1550
130	5C	0.873	56.8	492	5.34	10300	0.927	1960
130	5D	0.799	89.1	77.7	1.99	5800	1.07	1820
130	5E	1.13	28.5	1290	6.2	8180	<DL	1800
130	5F	1.11	57.8	39.6	2.54	4210	0.631	1480
130	6A	0.77	154	280	0.872	4550	<DL	2150
130	6B	1.47	547	163	3.38	8740	1.07	3830
130	6C	0.78	85.7	232	6.32	6220	1.16	3730
130	6D	0.682	64.1	61	1.42	4930	0.696	3340
130	6E	1.21	32.2	1800	5.77	8240	<DL	1610
130	6F	0.924	51.8	33.5	3.18	4040	<DL	1930
130	BCAL	0.152	<DL	36.5	<DL	1830	<DL	161
130	BDOL	0.13	<DL	16.4	0.231	1120	<DL	1960
130	R3	0.0818	3.46	4.82	<DL	794	<DL	3.08
133	1A	1	587	356	3.1	11500	1.94	2050
133	1B	1.45	595	268	3.2	5900	2.32	1800
133	1C	0.893	72.6	581	8.15	8150	1.86	1880
133	1D	0.952	137	86.1	11.1	5130	2.37	2140
133	1E	0.972	40.9	964	9.28	8050	0.92	2410
133	1F	1.43	105	34.2	13	5150	1.69	1910
133	2A	0.592	220	296	1.4	5140	0.753	1120
133	2B	1.19	414	362	3.22	5120	1.48	2300
133	2C	0.768	75.6	261	6.18	8440	1.56	2030
133	2D	2	142	485	10.3	16300	2.54	2570
133	2E	1.17	34.7	2710	8.8	8940	0.919	2880
133	2F	1.4	93.1	41.4	9.47	5110	1.42	1670
133	3A	0.578	140	219	0.594	8510	1.04	3480
133	3B	1.05	325	133	2.14	5350	1.84	4780
133	3C	0.714	84.8	34	6.67	7200	1.94	5530
133	3D	1.04	82.2	76.3	5.64	19800	2.23	5420
133	3E	1.15	58.8	33.5	10.1	7970	1.32	1120
133	3F	1.48	120	35.4	14.9	6700	1.99	2160
133	4A	0.547	234	134	1.14	12800	1.46	764
133	4B	1.1	463	71.3	3.22	7410	2.18	1390
133	4C	0.656	106	719	8.24	7140	2.14	1880
133	4D	0.806	149	61.5	9.54	5990	2.53	1930
133	4E	1.01	29.2	2380	7.84	5950	1.02	2040
133	4F	1.05	74.3	36.3	11.1	6560	1.43	2420
133	5A	0.846	182	237	0.839	24100	1.62	914
133	5B	1.43	430	268	2.39	13300	1.59	1340
133	5C	0.784	50.6	486	4.79	8680	1.72	1960

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
133	5D	0.76	89.9	68.6	6.24	4370	1.97	1820
133	5E	1.03	26.8	1260	5.62	7890	0.944	1800
133	5F	1.11	65.4	27.1	8	4790	1.25	1700
133	6A	0.865	185	329	1.02	7100	0.799	2280
133	6B	1.24	488	133	2.73	4900	1.8	3570
133	6C	0.628	75.9	206	5.51	7450	1.49	3440
133	6D	0.673	59.7	53.3	3.89	4420	1.61	3340
133	6E	1.07	27.5	1710	5.24	6120	1.03	1560
133	6F	1.21	59	25.5	7.27	4060	1.37	2520
133	BCAL	0.0756	<DL	42.5	<DL	624	<DL	150
133	BDOL	0.0784	<DL	9.07	0.218	877	<DL	2240
133	R4	0.2	7.66	<DL	<DL	1090	0.885	<DL
138	1A	1.54	641	386	3.55	17000	2.49	2450
138	1B	1.47	633	296	3.58	6890	2.47	1940
138	1C	0.808	67.9	574	7.71	5660	1.56	1950
138	1D	1.11	138	89.2	10.6	7660	2.93	2050
138	1E	1.1	45	268	9.52	6080	1.8	2660
138	1F	1.43	104	35.5	12.4	4700	2.38	2000
138	2A	0.672	212	277	1.58	4570	1.34	1260
138	2B	1.16	337	328	2.42	6450	1.59	1900
138	2C	0.812	65.1	262	5.87	5860	1.72	1960
138	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
138	2E	1.06	33.5	2260	8.52	9380	1.24	2920
138	2F	1.43	91.4	39.1	8.92	4610	1.88	1800
138	3A	0.52	131	184	0.57	3210	1.11	3870
138	3B	1.01	355	119	2.41	4500	1.72	5690
138	3C	0.756	84.4	32.1	6.52	4480	1.94	5810
138	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
138	3E	1.12	68	31.7	10.8	7030	1.12	1630
138	3F	1.71	131	45.1	15.6	6390	2.27	2800
138	4A	0.603	257	137	1.15	6350	1.6	794
138	4B	1.15	500	71.8	3.45	5070	2.47	1450
138	4C	0.702	104	114	8.13	5700	2.37	1970
138	4D	0.846	124	113	7.93	5920	2.48	1850
138	4E	1.02	28.5	2070	7.63	5780	1.07	2120
138	4F	1.06	69.7	36	9.95	4990	1.69	2510
138	5A	0.466	92.3	107	0.325	3070	0.893	487
138	5B	1.44	449	251	2.52	5530	2.01	1490
138	5C	0.689	48.9	385	4.68	4940	1.64	1930
138	5D	1.09	91.2	133	5.78	3990	2.34	1870
138	5E	0.962	26.2	873	5.16	4140	1.1	1870
138	5F	1.11	67.3	24	7.59	3810	1.24	1810

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
138	6A	0.889	160	222	0.99	3330	1.9	2890
138	6B	1.25	578	133	3.24	3990	2.02	4430
138	6C	0.762	74	195	5.33	3810	2.02	3620
138	6D	0.682	60.3	95.2	3.36	3460	1.65	3410
138	6E	1.06	27.9	1390	4.89	5600	1.06	1620
138	6F	1.17	57.3	22.8	6.65	4020	1.63	2600
138	BCAL	0.136	<DL	47.2	<DL	5500	0.56	152
138	BDOL	0.161	<DL	<DL	0.138	625	0.634	1820
138	R5	0.0856	17	<DL	<DL	144	0.497	<DL
140	1A	0.918	665	452	3.27	13400	1.42	2370
140	1B	1.1	550	242	2.74	6800	1.63	1830
140	1C	0.59	70.5	544	7	6430	0.769	2000
140	1D	0.754	136	69	9.29	5770	1.34	2080
140	1E	0.782	42.6	390	8.19	7840	<DL	2650
140	1F	1.2	103	35.9	11.1	5610	0.969	2140
140	2A	0.3	206	284	1.2	2150	<DL	973
140	2B	0.939	313	309	1.97	5630	<DL	1620
140	2C	0.576	66.1	282	5.15	6920	0.609	1980
140	2D	1.42	167	346	10.3	10500	1.4	2280
140	2E	1.17	30.7	2330	9.51	8380	<DL	3080
140	2F	1.57	87.1	50.9	9.94	4750	0.621	1850
140	3A	0.891	164	272	0.657	2780	<DL	3470
140	3B	1.07	278	132	2.02	5110	<DL	4480
140	3C	0.87	77.9	45.4	6.79	12700	<DL	5810
140	3D	1.06	91.2	74.1	6.13	4430	<DL	5750
140	3E	1.36	63.6	47.1	12.5	14000	<DL	1920
140	3F	1.83	128	50.5	17.6	6340	0.413	3250
140	4A	0.725	177	188	0.892	2000	<DL	489
140	4B	1.33	427	81.9	3.47	4700	<DL	1310
140	4C	0.908	98.1	254	8.86	5110	0.497	1850
140	4D	0.996	127	73.8	8.92	3760	0.769	1830
140	4E	1.04	24.5	1750	8.33	4810	<DL	2080
140	4F	1.24	68	50.1	11.7	5070	<DL	2640
140	5A	0.676	110	136	0.426	2580	<DL	467
140	5B	1.55	394	265	2.24	6110	<DL	1080
140	5C	0.939	44.7	367	5.2	4290	<DL	1820
140	5D	0.943	79.7	74.5	6.73	3470	<DL	1780
140	5E	1.13	22.1	849	5.83	5140	<DL	1760
140	5F	1.46	63.1	46.9	8.84	3980	<DL	1820
140	6A	1.01	134	243	0.983	1310	<DL	2000
140	6B	1.54	530	164	3.76	3250	<DL	4650
140	6C	1.02	68.5	228	6.21	3760	<DL	4030

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
140	6D	0.965	55.1	74.4	4.47	3090	<DL	3730
140	6E	1.37	23.2	1550	5.91	3900	<DL	1670
140	6F	1.54	52.5	49.2	7.92	3890	<DL	2810
140	BCAL	0.438	<DL	77.7	<DL	228	<DL	155
140	BDOL	0.313	<DL	28.3	0.238	312	<DL	2030
140	R6	0.347	12.9	15	<DL	228	<DL	<DL
144	1A	1.72	656	407	4.89	1450	<DL	2590
144	1B	1.67	581	336	3.62	11500	0.548	1810
144	1C	1.3	74.8	600	10.3	6040	0.431	2090
144	1D	1.21	122	110	12.2	4230	<DL	2220
144	1E	1.19	39.3	220	11.4	7110	<DL	3110
144	1F	1.79	94.9	57.6	14.3	5010	<DL	2350
144	2A	0.869	194	288	1.56	2940	<DL	1100
144	2B	1.52	310	329	2.74	4830	<DL	1700
144	2C	1.01	58.7	281	6.69	5160	<DL	1870
144	2D	2.25	126	550	10.5	4090	<DL	2560
144	2E	1.46	34.6	2190	10.9	8010	<DL	3390
144	2F	1.48	83.5	48.2	9.78	4310	<DL	1800
144	3A	0.849	145	220	0.808	4370	<DL	4240
144	3B	1.25	306	144	2.53	4830	<DL	5260
144	3C	0.862	77.8	51.9	7.49	5200	<DL	6000
144	3D	0.93	72.8	85.9	5.75	5560	<DL	4690
144	3E	1.34	66.9	53.8	13.8	9630	<DL	2570
144	3F	1.92	122	61.6	18.7	6500	<DL	4060
144	4A	1.07	282	177	1.63	3980	<DL	887
144	4B	1.35	442	90.5	3.73	4100	<DL	1290
144	4C	0.758	90.4	250	9.03	5670	<DL	1750
144	4D	1.08	120	77.6	9.57	4580	0.9	1820
144	4E	1.13	24.5	1580	9.55	6190	<DL	2340
144	4F	1.33	67.4	57.9	12.4	5140	<DL	2840
144	5A	0.626	70.2	122	0.379	6940	<DL	405
144	5B	1.6	378	269	2.33	7510	<DL	1090
144	5C	0.95	40.3	333	5.15	4960	<DL	1750
144	5D	0.982	79.9	87.5	6.81	3540	<DL	1830
144	5E	1.16	23.1	698	6.34	4620	<DL	1870
144	5F	1.33	58.1	46.6	8.9	3940	<DL	1820
144	6A	0.805	113	200	0.981	1990	<DL	1890
144	6B	1.34	499	147	3.49	3780	<DL	4500
144	6C	0.842	66.3	200	6.65	5140	<DL	4090
144	6D	0.845	51.4	75.5	4.43	3400	<DL	3830
144	6E	1.29	24.4	1320	5.96	3450	<DL	1700
144	6F	1.25	47.4	37.1	6.95	3670	<DL	2720

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
144	BCAL	0.326	<DL	71.9	<DL	887	<DL	105
144	BDOL	0.256	<DL	23.3	0.194	382	<DL	1760
144	R1	0.556	1.96	22.7	<DL	135	<DL	<DL
147	1A	1.34	719	340	5.44	1500	2.32	2790
147	1B	1.36	708	327	4.68	10300	2.66	2050
147	1C	0.681	69.8	579	9.61	7920	1.91	1970
147	1D	1.22	156	98.5	14.3	6920	3.88	2810
147	1E	0.82	38.5	256	11.6	8330	1.26	3290
147	1F	1.29	103	35.2	15.6	5800	1.96	2760
147	2A	0.489	199	278	1.54	3560	0.934	1090
147	2B	1.04	302	360	2.49	5610	1.21	1540
147	2C	0.668	59.9	269	6.41	9190	1.78	1910
147	2D	2.05	154	437	13.1	13900	3.95	2930
147	2E	0.898	33.6	1860	10.5	14000	1.04	3510
147	2F	1.5	93.4	50.7	11	5560	2.39	2170
147	3A	0.621	155	217	0.777	3360	1.19	4280
147	3B	0.901	284	147	2.24	3230	1.9	5000
147	3C	0.551	71.4	26.6	6.68	5140	2.01	5520
147	3D	0.688	79.6	53.8	5.93	5860	2.21	5570
147	3E	0.972	67.1	38.3	13.5	9640	1.55	3370
147	3F	1.89	141	54	20.3	7900	5.05	5100
147	4A	0.542	289	169	1.67	3450	2.12	960
147	4B	0.993	430	69.1	3.76	4640	2.68	1250
147	4C	0.47	96	240	8.59	6150	2.39	1810
147	4D	0.696	118	55.7	8.8	4360	2.75	1830
147	4E	0.788	26.2	1520	9.32	6610	1.14	2520
147	4F	0.91	67.1	36.6	12.3	5680	1.57	3030
147	5A	0.337	94.2	123	0.513	4660	0.818	592
147	5B	1.23	368	259	2.02	10500	1.58	1020
147	5C	0.518	40.7	340	4.91	7620	1.64	1810
147	5D	0.577	76.5	54.8	6.41	3340	2.12	1850
147	5E	0.775	22.9	767	5.92	8890	0.952	1880
147	5F	1.05	62.9	30.9	8.81	4830	1.53	1940
147	6A	0.573	142	267	1.02	7300	0.848	2040
147	6B	1.05	464	134	3.09	5120	1.85	4210
147	6C	0.585	75.9	190	6.45	5820	2.12	4350
147	6D	0.546	52.8	60.9	4.24	3310	1.47	3870
147	6E	0.919	23.4	1390	5.58	4870	0.948	1750
147	6F	0.998	47.5	19.2	6.9	4090	1.41	2890
147	BCAL	<DL	<DL	47.9	<DL	677	0.62	157
147	BDOL	<DL	<DL	7.98	0.212	952	0.518	2160
147	R2	<DL	<DL	<DL	<DL	3820	<DL	6.68

Table 13: cont

Time (days)	Column # and port location	Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
		Element, Unit, Detection Limit						
151	1A	1.13	754	409	5.74	22100	2.44	2950
151	1B	1.44	734	330	4.92	6830	2.75	2180
151	1C	0.686	64.4	556	9.31	6370	1.72	2080
151	1D	0.768	119	118	11.3	4460	2.79	2360
151	1E	1.23	46.5	122	12.6	11700	2.74	3890
151	1F	1.66	99.3	37	14	6110	2.79	2810
151	2A	0.474	171	251	1.27	3330	1.41	970
151	2B	0.997	263	375	2.25	7710	1.35	1420
151	2C	0.621	50.5	258	5.79	8490	1.91	1880
151	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
151	2E	0.798	38.6	85.7	10.6	9960	1.31	3330
151	2F	1.35	82.3	56.6	9.79	6480	1.82	2030
151	3A	0.605	171	269	1.08	10400	1.08	5570
151	3B	1.07	301	140	2.47	10100	2.5	5890
151	3C	0.444	65.9	27.8	6.21	6550	1.93	5470
151	3D	0.658	77.8	58.4	5.55	7600	2.03	5420
151	3E	0.962	73.8	39	12.6	11300	1.36	4350
151	3F	1.33	122	35.2	16.9	7230	2.07	5070
151	4A	0.262	132	81.7	0.677	5860	1.08	469
151	4B	0.952	440	65.6	3.4	6140	2.31	1270
151	4C	0.79	96.6	290	9.82	6750	3.34	2030
151	4D	0.693	116	54.5	8.52	5290	2.68	1790
151	4E	0.719	25	1320	8.65	8250	0.991	2450
151	4F	0.896	63.2	36.1	11.6	5710	2.16	2990
151	5A	1.03	88.1	128	0.272	10200	1.06	521
151	5B	1.3	360	249	1.95	13500	1.94	1010
151	5C	0.508	39.5	336	4.25	8470	1.6	1770
151	5D	0.595	75	59	5.9	4330	2.21	1820
151	5E	0.716	21.5	728	5.52	5900	0.949	1940
151	5F	0.984	60.1	30	7.96	4480	1.6	2000
151	6A	0.853	138	289	0.924	4300	1.96	2270
151	6B	1.03	437	127	2.78	6390	1.97	3950
151	6C	0.534	66.9	177	5.57	6180	2.14	4070
151	6D	0.492	48.5	66.7	3.82	3740	1.63	3800
151	6E	0.909	22.2	1240	5.28	6270	1.22	1850
151	6F	0.998	47.4	22.7	6.42	4150	1.58	2860
151	BCAL	0.0694	<DL	44.9	<DL	1130	0.943	142
151	BDOL	<DL	<DL	5.28	0.225	562	0.927	2150
151	R3	<DL	2.58	<DL	<DL	509	0.818	30.7
154	1A	0.82	474	270	3.01	9430	1.82	1770
154	1B	1.52	667	343	4.03	8030	2.6	1940
154	1C	0.889	82.9	639	9.96	6000	1.62	2170

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
154	1D	0.947	136	83.1	6.22	4630	2.36	2410
154	1E	1.02	41.1	130	10.8	6060	0.882	3400
154	1F	1.26	87.6	33.9	4.48	5360	1.45	2680
154	2A	0.669	219	340	1.61	1990	0.674	1270
154	2B	1.11	277	390	2.36	3650	0.948	1540
154	2C	0.729	50.4	274	5.13	5140	1.01	1730
154	2D	1.38	128	263	9.98	7880	1.77	2340
154	2E	1.12	35.7	2050	10.9	7470	0.839	3610
154	2F	1.1	65.6	28.6	3.72	4780	0.915	1860
154	3A	0.813	167	286	0.907	4900	<DL	4990
154	3B	0.95	273	119	2.11	3800	1.04	5000
154	3C	0.666	70.2	27.9	5.86	4270	1.29	5290
154	3D	0.691	80.6	41	2.82	4260	1.02	5030
154	3E	1.14	72.3	38.6	12.6	8670	0.743	5080
154	3F	1.18	86.5	24.6	6.26	5280	0.929	4000
154	4A	0.592	166	132	0.75	4270	<DL	526
154	4B	1.13	421	67.9	3.13	3440	1.43	1170
154	4C	0.576	87.6	299	7.85	5160	1.44	1700
154	4D	0.754	115	56.3	4.21	4250	1.95	1700
154	4E	0.957	26.3	1380	9.03	7860	<DL	2560
154	4F	0.61	37.8	18.1	5.58	3410	<DL	1900
154	5A	0.649	116	161	0.288	718	1.98	500
154	5B	1.4	367	253	1.55	7480	2.28	811
154	5C	0.737	42.2	364	3.65	5310	2.14	1610
154	5D	0.779	78.8	60.3	2.7	3550	2.45	1670
154	5E	0.97	24.3	639	5.01	5190	1.43	1960
154	5F	1.13	61.8	34.7	6.88	4270	1.93	2010
154	6A	0.817	126	259	0.641	6060	1.72	2230
154	6B	1.44	497	154	2.42	4800	2.78	3780
154	6C	0.729	74.7	171	4.85	4640	2.31	3830
154	6D	0.691	57.9	49.3	2.43	3330	1.87	3670
154	6E	1.01	25.6	1150	4.6	4310	1.23	1780
154	6F	1.1	48.8	29.6	2.58	3920	1.5	2480
154	BCAL	0.158	<DL	39.2	<DL	1920	0.825	170
154	BDOL	0.0854	<DL	5.68	0.153	1960	0.653	1970
154	R4	0.109	2.59	<DL	<DL	112	0.68	<DL
172	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	1B	2.394	642	927	3.06	6720	5.49	2514
172	1C	1.23	83.3	46.3	9.97	26600	2.17	2950
172	1D	1.18	153	79.3	12.1	10500	3.17	3030
172	1E	1.02	44.6	55.8	11.3	8210	1.16	3890
172	1F	0.943	58.8	34.1	6.82	4130	1.17	3460

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cr µg/L 0.06	Cu µg/L 1.8	Fe µg/L 4	Ga µg/L 0.12	K µg/L 6	Li µg/L 0.4	Mg µg/L 1
172	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2E	0.812	33.3	65.8	10.8	7300	0.887	3650
172	2F	0.959	59.3	39.4	4.81	3530	1.03	3040
172	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	3B	1.28	369	218	3.39	6800	1.58	13200
172	3C	0.678	71.9	43.5	6.88	4640	1.62	8600
172	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	3E	1.362	81.3	62.4	13.125	12255	1.314	5565
172	3F	1.03	66	34.5	7.34	3700	0.498	5910
172	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	4B	1.26	534	82	4.94	9230	2.14	1890
172	4C	0.626	86.1	27.6	7.76	6650	1.86	1940
172	4D	0.7875	108.3	55.2	7.005	16200	1.95	2355
172	4E	0.857	32.3	42.2	9.67	7790	0.918	3130
172	4F	0.729	42.3	38.5	6.03	4010	0.881	2990
172	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	5B	1.9775	139.825	414.75	2.2575	4340	2.835	2870
172	5C	0.762	40.8	47.6	4.48	15800	1.3	1770
172	5D	0.945	71.5	95.1	5.05	6020	1.9	1850
172	5E	1.15	24.3	53.6	5.61	4910	1.19	2020
172	5F	0.886	37.2	30.9	4.37	3290	0.914	2140
172	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	BCAL	0.151	11.5	66.3	<DL	6150	0.603	216
172	BDOL	<DL	5.35	14.4	0.262	1190	0.513	2370

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
0	1A	62.6	2460	132	81.1	21.2	12.4	1.87
0	1B	503	3680	363	74.8	<DL	17.2	0.52
0	1C	411	3850	258	14	<DL	19	<DL
0	1D	403	3190	306	10.3	<DL	19.7	<DL
0	1E	853	5360	297	12.8	<DL	13.5	<DL
0	1F	1650	5440	342	17.4	<DL	14	<DL
0	2A	49.8	1050	101	177	9.34	7.89	0.542
0	2B	308	2400	253	55.5	3.16	15.5	0.517
0	2C	723	2980	312	16	<DL	21.1	<DL
0	2D	443	4630	367	21.1	<DL	26.3	1.07
0	2E	469	3780	207	13.1	<DL	11.7	<DL
0	2F	692	6210	178	15.3	<DL	10.5	<DL
0	3A	67.2	1350	127	112	10.2	10.2	0.65
0	3B	353	1550	240	24	<DL	17.5	<DL
0	3C	556	1700	312	13.6	<DL	19.2	<DL
0	3D	672	6170	328	16	<DL	20.1	1.67
0	3E	571	4450	207	14	<DL	10.8	0.418
0	3F	680	7060	162	21.2	<DL	11.3	<DL
0	4A	3.16	339	18.2	17.7	<DL	3.08	<DL
0	4B	330	1190	258	15.4	<DL	17.2	<DL
0	4C	545	1940	323	12.3	<DL	18.2	<DL
0	4D	380	2740	376	10.3	<DL	19.7	<DL
0	4E	646	5940	214	13.6	<DL	11.5	<DL
0	4F	1150	8910	234	21.5	<DL	13	<DL
0	5A	8.04	440	25.2	18.5	2.07	3.38	<DL
0	5B	255	1330	219	21.1	<DL	14.7	<DL
0	5C	667	2000	326	13.2	<DL	19.4	<DL
0	5D	293	2330	363	10.4	<DL	19.7	<DL
0	5E	527	4070	213	13.7	<DL	11.9	<DL
0	5F	1150	9100	243	23.3	<DL	12.9	<DL
0	6A	60.3	971	94.1	29.4	<DL	9.55	<DL
0	6B	328	1190	231	19.5	<DL	14.3	<DL
0	6C	412	1930	316	10.8	<DL	18.8	<DL
0	6D	504	3950	404	16.1	<DL	21.4	0.917
0	6E	600	6440	234	14.3	<DL	11.3	<DL
0	6F	1160	8860	259	19.8	<DL	13.8	<DL
0	BCAL	<DL	454	3.9	11.9	<DL	<DL	<DL
0	BDOL	<DL	295	1.52	9.37	<DL	<DL	<DL
0	R1	<DL	23.2	<DL	9.28	<DL	<DL	<DL
4	1A	90.3	5100	199	118	18.7	16	10.4

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Mn	Na	Ni	P	Pb	Rb	Sb
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
		0.2	2	0.4	2	2	1	0.4
4	1B	356	3030	281	46.8	<DL	14.4	0.512
4	1C	601	3540	267	11.5	<DL	18	<DL
4	1D	429	3230	284	10.8	<DL	20.9	0.853
4	1E	812	4870	228	12.4	<DL	12	<DL
4	1F	1230	5110	277	17.6	<DL	13.3	0.65
4	2A	143	1630	219	159	16.1	14.6	1.12
4	2B	563	3930	383	33.6	3.18	21.5	0.431
4	2C	841	2830	304	13.5	<DL	20.7	<DL
4	2D	611	2110	314	13.6	<DL	20.6	0.652
4	2E	666	3680	204	11.1	<DL	11.9	<DL
4	2F	658	5900	175	13.7	<DL	11.9	0.725
4	3A	65.1	1100	116	105	16.4	8.88	1.05
4	3B	450	1730	274	30.2	<DL	17.4	<DL
4	3C	758	1800	321	13.8	<DL	19.8	<DL
4	3D	587	3430	277	14.6	<DL	20.3	1.6
4	3E	718	4430	218	11.3	<DL	11.2	<DL
4	3F	592	5950	137	14.6	<DL	11.2	0.609
4	4A	21.3	479	47.1	22.6	3.06	3.9	<DL
4	4B	380	1250	252	14.5	<DL	17	<DL
4	4C	792	2230	346	14	<DL	19.1	<DL
4	4D	584	2370	342	11.9	<DL	21	<DL
4	4E	940	5420	221	16.3	<DL	11.7	<DL
4	4F	846	7810	176	20.1	<DL	12	<DL
4	5A	160	1920	205	51.5	8.08	16.2	1.61
4	5B	311	1770	254	16.8	<DL	16.5	<DL
4	5C	936	2060	339	9.49	<DL	19.4	<DL
4	5D	546	1930	349	10.7	<DL	21.1	<DL
4	5E	709	3880	206	13.8	<DL	11.1	<DL
4	5F	850	7700	179	17	<DL	11.8	<DL
4	6A	55	579	72.2	44.3	16.2	8.02	<DL
4	6B	395	1390	268	17	<DL	16.6	<DL
4	6C	559	1970	332	12.9	<DL	18.1	<DL
4	6D	733	2210	364	16.5	<DL	19.7	<DL
4	6E	766	6300	231	15.8	<DL	11.7	<DL
4	6F	817	7260	185	19.7	<DL	11.9	<DL
4	BCAL	<DL	1500	1.75	10.6	<DL	1.08	<DL
4	BDOL	0.503	285	1.44	9.34	<DL	<DL	<DL
4	R3	<DL	102	<DL	11.1	<DL	<DL	<DL
7	1A	57.5	635	114	130	10.5	7.76	0.404
7	1B	331	2610	278	28.3	3.12	15	0.483
7	1C	684	3090	267	<DL	<DL	19.3	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
7	1D	555	2510	317	<DL	<DL	21.1	<DL
7	1E	855	4340	225	<DL	<DL	12.6	<DL
7	1F	995	4540	232	<DL	<DL	11.8	<DL
7	2A	79.9	917	140	70.7	9.65	9.49	<DL
7	2B	557	3300	393	22.1	3.32	21.7	0.421
7	2C	977	2930	337	3.7	<DL	22.8	<DL
7	2D	984	1750	381	<DL	<DL	22.1	<DL
7	2E	765	3360	195	<DL	<DL	12.4	<DL
7	2F	767	5370	206	3.5	<DL	13.4	<DL
7	3A	96	945	179	79.4	19.9	11.8	0.418
7	3B	634	1940	361	2.56	<DL	22.4	<DL
7	3C	728	1720	256	<DL	<DL	20.8	<DL
7	3D	859	2860	364	<DL	<DL	23.9	<DL
7	3E	948	3740	259	<DL	<DL	12.5	<DL
7	3F	604	5070	146	<DL	<DL	11.2	<DL
7	4A	16.8	346	46.1	6.11	2.56	2.95	<DL
7	4B	391	1210	236	<DL	<DL	18.1	<DL
7	4C	873	2060	330	<DL	<DL	20.7	<DL
7	4D	850	2250	369	<DL	<DL	20.6	<DL
7	4E	1070	4880	209	<DL	<DL	12.4	<DL
7	4F	793	6880	170	<DL	<DL	12.5	<DL
7	5A	78.8	983	108	29.8	4.91	9.06	0.511
7	5B	254	1540	226	4.68	<DL	17.7	<DL
7	5C	1000	1990	345	<DL	<DL	22.9	<DL
7	5D	878	1870	398	<DL	<DL	22.8	<DL
7	5E	880	3530	215	<DL	<DL	12.4	<DL
7	5F	742	6630	161	<DL	<DL	10.8	<DL
7	6A	29.7	438	60.7	12.1	6.34	6.11	<DL
7	6B	404	1510	294	3.94	<DL	18.9	<DL
7	6C	636	1950	342	<DL	<DL	19.9	<DL
7	6D	1190	2080	418	<DL	<DL	22	<DL
7	6E	821	5270	219	<DL	<DL	11.8	<DL
7	6F	757	6230	171	<DL	<DL	11.7	<DL
7	BCAL	<DL	713	5.46	<DL	<DL	<DL	<DL
7	BDOL	3.9	175	5.75	<DL	<DL	<DL	<DL
7	R4	<DL	73.7	3.97	<DL	<DL	<DL	<DL
11	1A	63.1	699	132	87	13.1	8.98	0.465
11	1B	331	2640	290	15.2	6.1	17.1	0.515
11	1C	667	2970	249	<DL	<DL	19.5	<DL
11	1D	528	2360	287	<DL	<DL	22.5	<DL
11	1E	913	4090	216	<DL	<DL	13.6	<DL
11	1F	847	4490	205	<DL	<DL	11.7	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
11	2A	81.4	850	168	121	14.4	10	<DL
11	2B	381	2320	294	25.1	4.03	18.2	0.428
11	2C	1090	2990	348	<DL	<DL	25.3	<DL
11	2D	1240	2260	416	<DL	<DL	28.6	<DL
11	2E	872	3310	193	<DL	<DL	13.5	<DL
11	2F	706	4590	180	<DL	<DL	12.7	<DL
11	3A	157	1160	297	77.7	30.1	15.3	0.602
11	3B	548	1930	329	5.32	2.04	22.4	<DL
11	3C	723	1770	244	<DL	<DL	21.6	<DL
11	3D	1100	3290	392	<DL	<DL	28.8	<DL
11	3E	1200	3590	218	<DL	<DL	13.7	<DL
11	3F	661	4870	164	<DL	<DL	12.2	<DL
11	4A	21.3	479	52.9	<DL	2.33	3.39	<DL
11	4B	349	1220	230	<DL	<DL	19.9	<DL
11	4C	831	1910	293	<DL	<DL	21.8	<DL
11	4D	913	2070	393	<DL	<DL	25.5	<DL
11	4E	1220	4500	197	<DL	<DL	12.9	<DL
11	4F	737	6190	153	<DL	<DL	11.9	<DL
11	5A	159	1820	246	59.8	7.83	14.6	1.06
11	5B	234	1470	207	6.4	<DL	17.8	<DL
11	5C	822	1940	252	<DL	<DL	23.8	<DL
11	5D	883	1920	377	<DL	<DL	27.8	<DL
11	5E	1000	3260	206	<DL	<DL	12.6	<DL
11	5F	787	6100	165	<DL	<DL	11.7	<DL
11	6A	42	418	85.4	19.1	5.49	6.29	<DL
11	6B	380	1550	281	<DL	<DL	20	<DL
11	6C	629	2030	320	<DL	<DL	21.3	<DL
11	6D	1190	1950	404	<DL	<DL	22.1	<DL
11	6E	958	4980	204	<DL	<DL	12.4	<DL
11	6F	743	5730	167	<DL	<DL	12.1	<DL
11	BCAL	<DL	424	0.661	<DL	<DL	<DL	<DL
11	BDOL	7.15	133	0.538	<DL	<DL	<DL	<DL
11	R5	<DL	74	<DL	<DL	<DL	<DL	<DL
14	1A	51.3	458	96.8	117	9.14	7.01	<DL
14	1B	365	2460	321	31.9	4.41	18.5	0.579
14	1C	666	2740	244	<DL	<DL	20.2	<DL
14	1D	444	1960	230	<DL	<DL	19.9	<DL
14	1E	972	3750	204	<DL	<DL	13.2	<DL
14	1F	785	4320	194	<DL	<DL	11.8	<DL
14	2A	81.6	759	188	151	19	10.2	<DL
14	2B	256	1750	246	43.9	7.82	16	0.476
14	2C	1100	2740	360	3.8	<DL	24.9	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
14	2D	937	1920	326	<DL	<DL	23.3	<DL
14	2E	910	3030	191	<DL	<DL	13	<DL
14	2F	734	4230	177	<DL	<DL	12.7	<DL
14	3A	128	1020	253	131	28.6	11.9	0.56
14	3B	325	1320	231	8.57	<DL	18.7	<DL
14	3C	693	1870	224	<DL	<DL	22.7	<DL
14	3D	868	2400	281	<DL	<DL	22.4	<DL
14	3E	1280	3360	213	<DL	<DL	13.8	<DL
14	3F	616	4340	148	<DL	<DL	11.8	<DL
14	4A	18.6	280	38.8	6.35	2.29	3.07	<DL
14	4B	326	1260	219	<DL	<DL	19.8	<DL
14	4C	756	1840	271	<DL	<DL	22	<DL
14	4D	707	1620	325	<DL	<DL	22.2	<DL
14	4E	1240	4020	191	<DL	<DL	12.4	<DL
14	4F	723	5680	153	<DL	<DL	11.9	<DL
14	5A	38.3	417	65.2	21.2	2.65	4.52	<DL
14	5B	194	1290	186	14.5	<DL	16	<DL
14	5C	770	1800	237	<DL	<DL	24.6	<DL
14	5D	800	1720	319	<DL	<DL	25.5	<DL
14	5E	1150	3180	212	<DL	<DL	12.5	<DL
14	5F	817	5620	162	<DL	<DL	11.1	<DL
14	6A	41.7	333	74.7	23.8	5.05	5.23	<DL
14	6B	378	1640	283	7.27	<DL	20.5	<DL
14	6C	595	1950	300	<DL	<DL	20.9	<DL
14	6D	1190	1870	389	3.13	<DL	22.1	<DL
14	6E	1050	4740	204	<DL	<DL	12.2	<DL
14	6F	743	5070	160	<DL	<DL	12	<DL
14	BCAL	<DL	356	0.835	<DL	<DL	<DL	<DL
14	BDOL	2.94	143	1.16	<DL	<DL	<DL	<DL
14	R6	<DL	19	<DL	<DL	<DL	<DL	<DL
18	1A	37	291	62.8	85.7	4.2	5.31	<DL
18	1B	428	2720	374	35.1	4.88	20.6	0.676
18	1C	633	2730	227	<DL	<DL	22.6	<DL
18	1D	412	1780	226	<DL	<DL	20.9	<DL
18	1E	1070	3530	200	<DL	<DL	14.3	<DL
18	1F	739	4130	180	<DL	<DL	12.5	<DL
18	2A	154	1050	310	137	28.7	14.1	0.491
18	2B	229	1530	239	46.9	8.05	15.1	0.5
18	2C	999	2380	348	<DL	<DL	24.8	<DL
18	2D	868	1880	296	<DL	<DL	25.8	<DL
18	2E	967	2850	189	<DL	<DL	13.8	<DL
18	2F	829	4140	186	<DL	<DL	14	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
18	3A	80.7	735	168	110	15.2	8.66	<DL
18	3B	244	986	186	3.07	<DL	16.3	<DL
18	3C	657	1720	228	<DL	<DL	24.3	<DL
18	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
18	3E	1330	3150	209	<DL	<DL	14.6	<DL
18	3F	735	4050	164	<DL	<DL	13.4	<DL
18	4A	13.9	122	27.1	13.9	<DL	2.33	<DL
18	4B	363	1500	252	<DL	<DL	23.4	<DL
18	4C	720	1670	263	<DL	<DL	23.8	<DL
18	4D	638	1590	304	<DL	<DL	23	<DL
18	4E	1310	3740	194	<DL	<DL	13	<DL
18	4F	339	3380	69.4	<DL	<DL	9.82	<DL
18	5A	31.5	674	79.3	34	<DL	5.49	0.412
18	5B	161	1070	159	8.39	<DL	15	<DL
18	5C	715	1670	222	<DL	<DL	25.2	<DL
18	5D	414	1150	171	<DL	<DL	21.9	<DL
18	5E	1180	3040	206	<DL	<DL	13	<DL
18	5F	892	5190	165	<DL	<DL	12	<DL
18	6A	184	967	169	36	6.33	10.9	<DL
18	6B	379	1660	296	8.49	<DL	21.8	<DL
18	6C	605	1970	302	<DL	<DL	24	<DL
18	6D	590	1190	219	<DL	<DL	17.1	<DL
18	6E	1100	4330	201	<DL	<DL	12.8	<DL
18	6F	439	3620	89.8	<DL	<DL	10.9	<DL
18	BCAL	<DL	190	0.924	<DL	<DL	<DL	<DL
18	BDOL	11	45.3	0.69	<DL	<DL	<DL	<DL
18	R1	<DL	18.9	<DL	<DL	<DL	<DL	<DL
21	1A	43.8	284	66.6	70.8	4.81	5.51	<DL
21	1B	363	2320	350	32.9	6.09	18.6	0.651
21	1C	593	2660	208	<DL	<DL	21.8	<DL
21	1D	388	1730	217	<DL	<DL	20.7	2.16
21	1E	1100	3130	190	<DL	<DL	13.1	<DL
21	1F	818	4130	188	<DL	<DL	13	<DL
21	2A	102	681	209	77.9	18.7	9.84	<DL
21	2B	228	1430	261	66.3	11.8	14.7	0.491
21	2C	917	2190	343	<DL	<DL	24.6	<DL
21	2D	672	2310	240	<DL	<DL	23.3	<DL
21	2E	1060	2700	195	<DL	<DL	13.6	<DL
21	2F	983	4000	199	<DL	<DL	14.1	<DL
21	3A	186	1050	333	94.2	32	14.3	0.569
21	3B	197	779	157	2.74	<DL	13.9	<DL
21	3C	633	1560	220	<DL	<DL	24.9	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
21	3D	911	2050	293	2.21	<DL	25.8	<DL
21	3E	1440	2990	216	<DL	<DL	14.6	<DL
21	3F	828	3620	170	<DL	<DL	13.4	<DL
21	4A	48.2	229	63	5.2	2.8	3.86	<DL
21	4B	346	1500	247	3.74	<DL	23.8	<DL
21	4C	713	1650	254	<DL	<DL	24.5	<DL
21	4D	600	1480	284	<DL	<DL	23.6	<DL
21	4E	1300	3280	186	<DL	<DL	12.5	<DL
21	4F	774	4750	154	<DL	<DL	12.5	<DL
21	5A	48.7	554	118	50.3	6.9	6.16	2.25
21	5B	182	1120	182	13.3	2.46	15.4	0.432
21	5C	643	1560	206	<DL	<DL	23.9	<DL
21	5D	655	1550	264	<DL	<DL	27.3	0.631
21	5E	1320	2860	214	<DL	<DL	13.2	<DL
21	5F	1010	4930	176	<DL	<DL	12.7	<DL
21	6A	62.9	348	120	36.9	10.4	6.04	<DL
21	6B	334	1550	278	10.6	<DL	21	<DL
21	6C	588	1940	293	<DL	<DL	24.5	<DL
21	6D	1000	1670	353	<DL	<DL	21.3	<DL
21	6E	1120	4000	197	<DL	<DL	12.3	<DL
21	6F	841	4480	159	2.05	<DL	12.4	<DL
21	BCAL	<DL	134	0.793	<DL	<DL	<DL	<DL
21	BDOL	5.87	76	0.652	<DL	<DL	<DL	<DL
21	R2	<DL	152	0.779	<DL	<DL	<DL	<DL
25	1A	72.7	304	97.7	21.7	3.63	6.68	<DL
25	1B	363	2080	346	24.9	6.33	19.4	0.608
25	1C	527	2480	190	<DL	<DL	23.1	<DL
25	1D	361	1610	203	<DL	<DL	23.6	0.469
25	1E	1090	2900	190	<DL	<DL	13.9	<DL
25	1F	836	3820	178	<DL	<DL	13.8	<DL
25	2A	117	666	206	67.8	16.8	10.3	0.431
25	2B	242	1360	278	59.1	12.8	16.1	0.496
25	2C	733	1970	287	<DL	<DL	23.8	<DL
25	2D	122	1090	52.4	<DL	<DL	5.05	<DL
25	2E	1050	2500	187	<DL	<DL	14.2	<DL
25	2F	1070	3540	200	<DL	<DL	15	<DL
25	3A	107	561	208	77.5	13.4	8.2	<DL
25	3B	228	736	182	<DL	<DL	14.5	<DL
25	3C	575	1400	226	<DL	<DL	24.8	<DL
25	3D	690	1570	235	<DL	<DL	21.7	<DL
25	3E	1390	2780	222	<DL	<DL	15	<DL
25	3F	888	3280	190	<DL	<DL	14.9	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
25	4A	70.8	245	94	2.01	2.46	4.53	<DL
25	4B	301	1280	248	<DL	<DL	22.5	<DL
25	4C	675	1680	263	<DL	<DL	27.1	<DL
25	4D	582	1530	306	<DL	<DL	26	0.507
25	4E	1330	3140	201	<DL	<DL	12.8	<DL
25	4F	866	4410	179	<DL	<DL	13.9	<DL
25	5A	41.6	485	118	26.6	5.34	6.08	1.26
25	5B	237	1310	233	9.14	2.34	18	0.44
25	5C	625	1610	217	<DL	<DL	25.6	<DL
25	5D	613	1540	271	<DL	<DL	28.4	<DL
25	5E	1340	2720	226	<DL	<DL	13.9	<DL
25	5F	1080	4350	191	<DL	<DL	14.2	<DL
25	6A	80.7	564	150	33.1	6.41	8.47	<DL
25	6B	312	1500	282	5.66	<DL	22.5	<DL
25	6C	548	1950	297	<DL	<DL	27.3	<DL
25	6D	811	1620	300	<DL	<DL	21.4	<DL
25	6E	1170	3760	212	<DL	<DL	13.2	<DL
25	6F	884	3940	184	<DL	<DL	14.1	<DL
25	BCAL	<DL	141	14.7	<DL	<DL	<DL	<DL
25	BDOL	8.52	105	13.9	<DL	<DL	<DL	<DL
25	R3	<DL	34.8	13.2	<DL	<DL	<DL	<DL
28	1A	116	369	139	<DL	3.59	7.07	<DL
28	1B	360	1750	341	<DL	3.89	19.2	0.467
28	1C	490	2460	186	<DL	<DL	22.1	<DL
28	1D	356	1630	207	<DL	<DL	22.8	<DL
28	1E	1010	2590	177	<DL	<DL	12.9	<DL
28	1F	860	3460	181	<DL	<DL	13	<DL
28	2A	83.9	549	125	66.5	7.42	6.94	<DL
28	2B	217	1310	252	27.5	7.36	14.2	<DL
28	2C	538	1750	224	<DL	<DL	20.9	<DL
28	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
28	2E	997	2280	182	<DL	<DL	12.8	<DL
28	2F	1110	3230	209	<DL	<DL	14.6	<DL
28	3A	98.2	491	150	15.4	8.79	7.11	<DL
28	3B	284	809	213	<DL	<DL	14.7	<DL
28	3C	448	1250	183	<DL	<DL	22.2	<DL
28	3D	688	1650	234	<DL	<DL	21.9	<DL
28	3E	1260	2490	206	<DL	<DL	13.3	<DL
28	3F	933	2970	175	<DL	<DL	14.4	<DL
28	4A	69.8	242	65.1	<DL	<DL	2.95	<DL
28	4B	263	1150	217	<DL	<DL	20	<DL
28	4C	629	1640	245	<DL	<DL	26.9	<DL

Table 13: cont

		Element, Unit, Detection Limit						
Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
28	4D	533	1460	286	<DL	<DL	25.5	<DL
28	4E	1160	2760	172	<DL	<DL	11.4	<DL
28	4F	776	3690	149	<DL	<DL	12	<DL
28	5A	35.6	475	82.8	7.28	4.36	4.37	0.911
28	5B	221	1220	206	<DL	2.74	16.4	<DL
28	5C	583	1870	200	<DL	<DL	26.6	<DL
28	5D	505	1450	212	<DL	<DL	24.7	<DL
28	5E	1210	2480	198	<DL	<DL	12.4	<DL
28	5F	1160	4350	189	<DL	<DL	13.9	<DL
28	6A	117	625	104	2.99	2.6	7.38	<DL
28	6B	306	1360	273	<DL	<DL	21.3	<DL
28	6C	497	1920	268	<DL	<DL	26.7	<DL
28	6D	636	1640	239	<DL	<DL	19.8	<DL
28	6E	1050	3240	183	<DL	<DL	10.9	<DL
28	6F	783	3260	155	<DL	<DL	11.2	<DL
28	BCAL	2.78	205	<DL	<DL	<DL	<DL	<DL
28	BDOL	9.97	160	<DL	<DL	<DL	<DL	<DL
28	R4	0.526	59.3	<DL	<DL	<DL	<DL	<DL
32	1A	318	490	360	<DL	5.02	8.59	<DL
32	1B	432	1530	392	<DL	3.13	18.4	<DL
32	1C	511	2300	187	<DL	<DL	24.1	<DL
32	1D	365	1570	217	<DL	<DL	24.5	<DL
32	1E	916	2250	162	<DL	<DL	11.6	<DL
32	1F	838	3110	172	<DL	<DL	12.7	<DL
32	2A	121	530	165	62.1	7.08	7.97	<DL
32	2B	246	1180	265	27.2	7.06	14.1	<DL
32	2C	460	1660	184	<DL	<DL	20.2	<DL
32	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
32	2E	981	2180	179	<DL	<DL	13.2	<DL
32	2F	1190	3020	224	<DL	<DL	15.5	<DL
32	3A	150	467	174	48.9	5.31	7.86	<DL
32	3B	439	732	309	<DL	<DL	16	<DL
32	3C	449	1170	193	<DL	<DL	24	<DL
32	3D	607	1390	228	<DL	<DL	20.8	<DL
32	3E	1210	2450	197	5.72	<DL	13.6	<DL
32	3F	909	2800	173	<DL	<DL	14	<DL
32	4A	133	315	144	<DL	<DL	3.67	<DL
32	4B	275	1040	239	<DL	<DL	19.6	<DL
32	4C	558	1500	225	<DL	<DL	26	<DL
32	4D	469	1320	271	<DL	<DL	25.4	<DL
32	4E	1170	2630	175	<DL	<DL	11.8	<DL
32	4F	806	3340	157	<DL	<DL	12.7	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
32	5A	18.8	311	49.7	6.52	2.55	2.82	0.492
32	5B	257	1210	232	<DL	<DL	17.4	<DL
32	5C	473	1610	165	<DL	<DL	24	<DL
32	5D	484	1490	209	<DL	<DL	25.8	<DL
32	5E	1260	2510	204	<DL	<DL	13	<DL
32	5F	1060	3680	173	<DL	<DL	12.9	<DL
32	6A	223	593	143	3.34	<DL	10.9	<DL
32	6B	489	1670	415	<DL	<DL	26.7	<DL
32	6C	454	1820	247	<DL	<DL	25.4	<DL
32	6D	574	1530	202	<DL	<DL	18.8	<DL
32	6E	1030	3120	183	<DL	<DL	11.5	<DL
32	6F	832	3230	163	<DL	<DL	12.5	<DL
32	BCAL	3.32	190	<DL	<DL	<DL	<DL	<DL
32	BDOL	9.83	142	<DL	<DL	<DL	<DL	<DL
32	R5	0.341	140	<DL	<DL	<DL	<DL	<DL
35	1A	390	201	402	50.5	5.46	6.95	<DL
35	1B	612	1330	475	29.3	3.33	20.5	0.684
35	1C	546	2060	175	4.79	<DL	25.2	<DL
35	1D	440	1390	243	<DL	<DL	25.6	<DL
35	1E	1010	2040	167	<DL	<DL	13.1	<DL
35	1F	1020	2940	192	<DL	<DL	14.3	<DL
35	2A	113	279	138	63.1	5.52	6.91	<DL
35	2B	311	976	303	49.8	6.32	14.8	<DL
35	2C	457	1430	162	<DL	<DL	21.6	<DL
35	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
35	2E	1100	2000	186	<DL	<DL	14.2	<DL
35	2F	1430	2800	246	<DL	<DL	16.4	<DL
35	3A	176	215	181	34	4.1	6.66	<DL
35	3B	546	586	379	3	<DL	15.4	<DL
35	3C	523	1080	219	<DL	<DL	26.8	<DL
35	3D	704	1280	249	<DL	<DL	21.7	<DL
35	3E	1570	2370	230	<DL	<DL	16.4	<DL
35	3F	1030	2410	180	<DL	<DL	15	<DL
35	4A	122	63.2	135	4.11	<DL	2.93	<DL
35	4B	348	854	297	14.4	<DL	20.3	<DL
35	4C	649	1450	248	3.03	<DL	28.5	<DL
35	4D	613	1290	318	<DL	<DL	27.9	<DL
35	4E	1220	2260	167	<DL	<DL	11.8	<DL
35	4F	1010	3200	179	<DL	<DL	14	<DL
35	5A	16.1	99.1	44.8	8.99	<DL	2.52	<DL
35	5B	358	1030	291	7.66	<DL	19.7	<DL
35	5C	544	1470	172	<DL	<DL	26.6	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
35	5D	540	1340	222	<DL	<DL	26.8	<DL
35	5E	100	2180	210	<DL	<DL	12	<DL
35	5F	87	3090	183	<DL	<DL	11.5	<DL
35	6A	19	377	147	<DL	<DL	8.82	<DL
35	6B	40	1150	387	<DL	<DL	22.2	<DL
35	6C	47	1770	343	<DL	<DL	30.2	<DL
35	6D	42.5	1370	195	<DL	<DL	18.3	<DL
35	6E	87.6	2620	198	<DL	<DL	10.6	<DL
35	6F	68.7	2720	171	<DL	<DL	11.3	<DL
35	BCAL	<DL	81.7	0.75	<DL	<DL	<DL	<DL
35	BDOL	0.204	40.1	<DL	<DL	<DL	<DL	<DL
35	R6	<DL	29.2	<DL	<DL	<DL	<DL	<DL
39	1A	40.9	307	508	27.4	6.76	5.85	<DL
39	1B	58.1	1270	590	<DL	3.62	18.7	<DL
39	1C	40.3	1920	182	<DL	<DL	23.2	<DL
39	1D	31.5	1290	244	<DL	<DL	22.7	<DL
39	1E	72.1	1810	172	<DL	<DL	11.3	<DL
39	1F	72.5	2530	190	<DL	<DL	11.9	<DL
39	2A	22.1	414	320	30.9	6.21	7.97	<DL
39	2B	30.1	883	363	17.4	5.48	12.6	<DL
39	2C	29.6	1250	142	<DL	<DL	17.4	<DL
39	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
39	2E	73.4	1760	180	<DL	<DL	12.3	<DL
39	2F	97.8	2400	252	<DL	<DL	14.3	<DL
39	3A	28.6	286	370	4.05	5.07	6.1	<DL
39	3B	44.2	457	400	<DL	<DL	12.2	<DL
39	3C	36.7	928	222	<DL	<DL	22.4	<DL
39	3D	53.9	1290	309	<DL	34.5	23.6	<DL
39	3E	99.2	1900	218	<DL	<DL	13.6	<DL
39	3F	72	2060	188	<DL	<DL	13	<DL
39	4A	17.3	194	267	<DL	2.47	2.89	<DL
39	4B	36.3	765	401	<DL	<DL	18.2	<DL
39	4C	47.9	1180	273	<DL	<DL	24.9	<DL
39	4D	45	1200	339	<DL	<DL	25.8	<DL
39	4E	89.2	2070	175	<DL	<DL	11	<DL
39	4F	63.9	2480	169	<DL	<DL	11.2	<DL
39	5A	0.974	104	31.2	<DL	<DL	1.87	<DL
39	5B	35.8	1050	369	<DL	<DL	18.4	<DL
39	5C	39.3	1500	180	<DL	<DL	24.7	<DL
39	5D	36.6	1240	217	<DL	<DL	23.6	<DL
39	5E	95.7	1970	202	<DL	<DL	11.4	<DL
39	5F	80.2	2650	178	<DL	<DL	11.4	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Mn	Na	Ni	P	Pb	Rb	Sb
		µg/L 0.2	µg/L 2	µg/L 0.4	µg/L 2	µg/L 2	µg/L 1	µg/L 0.4
39	6A	20	486	241	<DL	<DL	6.67	<DL
39	6B	48.6	979	464	<DL	2.47	22	<DL
39	6C	50.4	1770	358	<DL	<DL	31.4	<DL
39	6D	41.9	1400	174	<DL	<DL	19.4	<DL
39	6E	75.2	2280	174	<DL	<DL	9.98	<DL
39	6F	66.7	2450	178	<DL	<DL	11.9	<DL
39	BCAL	<DL	89.9	0.735	<DL	<DL	<DL	<DL
39	BDOL	0.217	55.8	3.41	<DL	<DL	<DL	<DL
39	R1	<DL	18.8	<DL	<DL	<DL	<DL	<DL
42	1A	333	451	385	<DL	4.89	3.86	<DL
42	1B	897	1190	689	3.91	4.31	23.4	<DL
42	1C	661	2020	225	<DL	<DL	33.2	<DL
42	1D	519	1360	306	<DL	<DL	31.1	<DL
42	1E	1060	1970	196	<DL	<DL	15.9	<DL
42	1F	1100	2680	225	<DL	<DL	16.9	<DL
42	2A	369	342	391	21.3	5.69	8.63	<DL
42	2B	561	906	463	<DL	5.17	17.3	<DL
42	2C	463	1420	160	<DL	<DL	25.9	<DL
42	2D	723	1930	287	<DL	<DL	32.8	<DL
42	2E	1090	1910	202	<DL	<DL	17.2	<DL
42	2F	1420	2500	294	<DL	<DL	19.7	<DL
42	3A	476	256	463	<DL	6.09	6.3	<DL
42	3B	625	428	460	<DL	<DL	14.5	<DL
42	3C	569	964	272	<DL	<DL	30.9	<DL
42	3D	679	1230	358	<DL	<DL	29.4	<DL
42	3E	1510	2210	262	<DL	<DL	19.9	<DL
42	3F	1110	2330	222	<DL	<DL	19.2	<DL
42	4A	135	117	153	<DL	<DL	1.98	<DL
42	4B	699	799	588	<DL	<DL	23.9	<DL
42	4C	807	1370	369	<DL	<DL	38.1	<DL
42	4D	725	1320	425	<DL	<DL	35.6	<DL
42	4E	1270	2160	191	<DL	<DL	14.4	<DL
42	4F	986	2700	207	<DL	<DL	16.8	<DL
42	5A	16.3	124	26.2	<DL	<DL	1.56	<DL
42	5B	762	1130	544	<DL	<DL	26.9	<DL
42	5C	597	1620	206	<DL	<DL	34.1	<DL
42	5D	558	1420	254	<DL	<DL	33.9	<DL
42	5E	1420	2170	228	<DL	<DL	16.7	<DL
42	5F	1220	2880	217	<DL	<DL	16.6	<DL
42	6A	189	294	188	<DL	<DL	4.7	<DL
42	6B	1060	1160	766	<DL	<DL	33.2	<DL
42	6C	885	1880	463	<DL	<DL	46.9	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
42	6D	606	1580	168	<DL	<DL	31.8	<DL
42	6E	1260	2550	216	<DL	<DL	15.4	<DL
42	6F	977	2700	206	<DL	<DL	17.1	<DL
42	BCAL	3.08	87.1	0.943	<DL	<DL	<DL	<DL
42	BDOL	7.34	71.1	0.494	<DL	<DL	<DL	<DL
42	R2	<DL	21.8	<DL	<DL	<DL	<DL	<DL
47	1A	1040	1005	1115	n.d.	11.275	8.8	n.d.
47	1B	1140	1160	902	<DL	4.5	23.3	<DL
47	1C	641	1940	211	<DL	<DL	32.6	<DL
47	1D	517	1260	311	<DL	<DL	29.4	<DL
47	1E	1040	2000	196	<DL	<DL	16.9	<DL
47	1F	1060	2640	244	<DL	<DL	18.4	<DL
47	2A	812	430	697	34.6	9.15	8.99	<DL
47	2B	939	911	704	<DL	5.78	17.8	<DL
47	2C	478	1470	149	<DL	<DL	27.1	<DL
47	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
47	2E	1020	1940	194	<DL	<DL	18.2	<DL
47	2F	1420	2430	320	<DL	<DL	21.1	<DL
47	3A	307	528	288	<DL	<DL	3.94	<DL
47	3B	748	423	541	<DL	<DL	13.9	<DL
47	3C	573	901	281	<DL	<DL	30.3	<DL
47	3D	767	1450	392	<DL	<DL	29.2	<DL
47	3E	1600	2120	282	<DL	<DL	22.7	<DL
47	3F	941	2220	223	<DL	<DL	20.2	<DL
47	4A	154	214	182	<DL	2.07	1.62	<DL
47	4B	908	701	806	<DL	<DL	22	<DL
47	4C	841	1400	392	<DL	<DL	36.5	<DL
47	4D	782	1260	444	<DL	<DL	35.2	<DL
47	4E	1200	2090	186	<DL	<DL	15	<DL
47	4F	871	2620	210	<DL	<DL	17.6	<DL
47	5A	21.7	163	31.4	<DL	<DL	1.7	<DL
47	5B	1490	1320	1110	<DL	2.29	32.5	<DL
47	5C	568	1530	193	<DL	<DL	33	<DL
47	5D	594	1510	285	<DL	<DL	34.8	<DL
47	5E	1340	2220	224	<DL	<DL	17.5	<DL
47	5F	1240	3120	246	<DL	<DL	20.2	<DL
47	6A	214	397	229	<DL	<DL	4.37	<DL
47	6B	1540	1270	1150	<DL	<DL	34.8	<DL
47	6C	913	1920	489	<DL	<DL	47.6	<DL
47	6D	554	1600	143	<DL	<DL	32.3	<DL
47	6E	1260	2530	221	<DL	<DL	16.7	<DL
47	6F	964	2680	224	<DL	<DL	19.5	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
47	BCAL	1.97	103	0.932	<DL	<DL	<DL	<DL
47	BDOL	7.51	80.6	0.785	<DL	<DL	<DL	<DL
47	R3	<DL	34.2	0.661	<DL	<DL	<DL	<DL
49	1A	285	264	360	5.85	4.31	3.65	<DL
49	1B	929	989	775	30	4.16	17.4	<DL
49	1C	716	1870	241	8.54	<DL	30.6	<DL
49	1D	613	1420	369	6.59	<DL	30.9	<DL
49	1E	940	2040	188	7.26	<DL	16.5	<DL
49	1F	971	2660	241	3.61	<DL	17.7	<DL
49	2A	606	320	572	43.4	8.33	5.69	<DL
49	2B	838	801	665	3.18	6.1	14.1	<DL
49	2C	488	1410	149	2.01	<DL	26	<DL
49	2D	781	1930	307	4.27	<DL	35.3	<DL
49	2E	913	1970	185	<DL	<DL	17.3	<DL
49	2F	1230	2390	302	2.49	<DL	19.7	<DL
49	3A	233	338	272	26.7	3.41	3.08	<DL
49	3B	542	382	445	8.4	<DL	10.8	<DL
49	3C	623	933	321	9.44	<DL	28.9	<DL
49	3D	760	1170	416	6.09	<DL	31.4	<DL
49	3E	1490	2240	287	7.84	<DL	22.1	<DL
49	3F	923	2340	246	7.66	<DL	20.9	<DL
49	4A	118	126	150	9.34	<DL	1.42	<DL
49	4B	767	625	714	8.61	<DL	17.3	<DL
49	4C	898	1250	427	4.21	<DL	35	<DL
49	4D	812	1260	448	5.9	<DL	32.6	<DL
49	4E	1130	2210	181	6.27	<DL	14.5	<DL
49	4F	740	2520	201	2.2	<DL	17	<DL
49	5A	18.8	168	37.9	9.82	<DL	1.81	<DL
49	5B	1590	1240	1220	<DL	2.65	27.9	<DL
49	5C	676	1780	233	2.61	<DL	37.6	<DL
49	5D	609	1480	314	<DL	<DL	35.2	<DL
49	5E	1160	2080	200	2.11	<DL	16	<DL
49	5F	1010	2820	228	2.24	<DL	17.5	<DL
49	6A	165	334	189	9.11	2.01	4.18	0.597
49	6B	1250	947	1020	<DL	<DL	24.8	<DL
49	6C	949	1620	500	<DL	<DL	44.4	<DL
49	6D	615	1650	159	4.63	<DL	34.6	<DL
49	6E	1150	2470	213	4.3	<DL	15.7	<DL
49	6F	849	2590	218	2.22	<DL	18.4	<DL
49	BCAL	1.75	172	0.655	4.39	<DL	<DL	<DL
49	BDOL	5.5	139	0.557	<DL	<DL	<DL	<DL
49	R4	<DL	20.6	<DL	<DL	<DL	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
53	1A	275	265	341	23.5	4.92	2.73	<DL
53	1B	863	918	736	8.73	4.12	14.2	<DL
53	1C	758	1760	261	<DL	<DL	30.4	<DL
53	1D	581	1290	361	3.45	<DL	28.3	<DL
53	1E	885	2030	176	8.54	<DL	17.6	<DL
53	1F	897	2650	248	5.63	<DL	20.1	<DL
53	2A	601	369	571	8.76	9.06	4.29	<DL
53	2B	1000	793	798	8	6.78	12.3	<DL
53	2C	546	1500	151	5.22	<DL	26.9	<DL
53	2D	622	1640	263	9.34	<DL	27.9	<DL
53	2E	891	2070	188	5.95	<DL	19.6	<DL
53	2F	1120	2390	310	6.37	<DL	22	<DL
53	3A	277	456	344	17.4	4.86	2.65	<DL
53	3B	528	397	457	2.9	<DL	9.22	<DL
53	3C	605	873	335	8.03	<DL	27.1	<DL
53	3D	701	1120	421	6.61	<DL	26.1	<DL
53	3E	1363.5	2175	268.5	6.3	n.d.	22.65	n.d.
53	3F	756	2270	235	4.86	<DL	22.3	<DL
53	4A	246	423	313	11	3.98	2.12	<DL
53	4B	864	670	844	18.1	<DL	16.7	<DL
53	4C	887	1260	429	4.85	<DL	33.1	<DL
53	4D	873	1300	473	9.51	<DL	33.4	<DL
53	4E	1070	2160	177	3.67	<DL	15.1	<DL
53	4F	671	2530	219	2.4	<DL	19.4	<DL
53	5A	47	221	67.3	8.4	<DL	2.41	<DL
53	5B	2070	1420	1670	4.26	4.27	27.7	<DL
53	5C	750	1880	265	3.48	<DL	39.4	<DL
53	5D	743	1540	403	5.5	<DL	39	<DL
53	5E	1120	2060	197	<DL	<DL	17.1	<DL
53	5F	936	2770	242	7.03	<DL	19.8	<DL
53	6A	147	389	182	9.44	2.42	3.3	<DL
53	6B	1260	819	1100	<DL	<DL	20.3	<DL
53	6C	1050	1520	567	<DL	<DL	41.3	<DL
53	6D	612	1430	159	<DL	<DL	33.4	<DL
53	6E	1090	2330	210	3.59	<DL	15.9	<DL
53	6F	768	2470	220	<DL	<DL	20.4	<DL
53	BCAL	2.99	147	1.71	<DL	<DL	<DL	<DL
53	BDOL	6.02	95.1	0.932	<DL	<DL	<DL	<DL
53	R5	<DL	40.2	1.43	<DL	<DL	<DL	<DL
56	1A	314	229	415	34.7	6.13	3.23	<DL
56	1B	727	782	776	6.79	4.02	13	<DL
56	1C	736	1570	317	8.6	<DL	31.6	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
56	1D	685	1270	420	5.07	<DL	30.6	<DL
56	1E	783	2000	199	2.74	<DL	19.5	<DL
56	1F	813	2650	304	2.46	<DL	22.8	<DL
56	2A	450	282	535	8.88	7.9	3.59	<DL
56	2B	840	736	840	7.16	6.43	10.8	<DL
56	2C	647	968	197	<DL	<DL	30.5	<DL
56	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
56	2E	807	2120	221	<DL	<DL	21.9	<DL
56	2F	1080	2400	372	<DL	<DL	25.7	<DL
56	3A	259	513	380	11.3	6.29	3.9	<DL
56	3B	436	335	463	<DL	<DL	8.46	<DL
56	3C	587	744	385	<DL	<DL	27.4	<DL
56	3D	756	1010	455	<DL	<DL	29.4	<DL
56	3E	1186.5	2160	313.5	n.d.	n.d.	24.6	n.d.
56	3F	661	2280	279	<DL	<DL	25.5	<DL
56	4A	234	153	364	<DL	4.02	2.13	<DL
56	4B	728	593	906	<DL	<DL	14.5	<DL
56	4C	875	1220	464	<DL	<DL	35.3	<DL
56	4D	859	1150	545	<DL	<DL	33.4	<DL
56	4E	965	2130	201	<DL	<DL	16.5	<DL
56	4F	602	2630	269	<DL	<DL	22.4	<DL
56	5A	35.2	168	68.4	3.26	<DL	1.8	0.4
56	5B	1990	1250	2020	<DL	4.51	25.3	<DL
56	5C	835	1810	346	<DL	<DL	43	<DL
56	5D	844	1450	460	<DL	<DL	42.3	<DL
56	5E	1060	2190	240	<DL	<DL	19.9	<DL
56	5F	806	2690	288	<DL	<DL	22	<DL
56	6A	149	387	209	9.86	2.01	4.86	<DL
56	6B	994	668	1120	3.87	<DL	16.8	<DL
56	6C	1040	1270	681	<DL	<DL	41.8	<DL
56	6D	589	1330	182	2.36	<DL	34.7	<DL
56	6E	1020	2250	246	<DL	<DL	18.2	<DL
56	6F	735	2550	277	<DL	<DL	24.5	<DL
56	BCAL	2.66	44	<DL	<DL	<DL	<DL	<DL
56	BDOL	5.71	25.6	<DL	<DL	<DL	<DL	<DL
56	R6	0.2	<DL	<DL	<DL	<DL	<DL	<DL
60	1A	290	347	401	116	5.14	3.1	<DL
60	1B	688	701	747	7.13	3.86	11.3	<DL
60	1C	768	1480	334	<DL	<DL	28.7	<DL
60	1D	802	1210	508	<DL	<DL	29.7	<DL
60	1E	769	2040	200	<DL	<DL	20.4	<DL
60	1F	726	2690	303	<DL	<DL	24.8	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
60	2A	404	256	495	15.1	6.89	3.6	<DL
60	2B	855	704	871	3.74	6.62	9.95	<DL
60	2C	750	1430	208	<DL	<DL	28.1	<DL
60	2D	1017	2565	526.5	4.785	n.d.	38.85	n.d.
60	2E	771	2180	219	<DL	<DL	23	<DL
60	2F	1000	2370	375	<DL	<DL	26.9	<DL
60	3A	219	457	336	6.9	4.93	3.07	<DL
60	3B	436	379	474	34	<DL	6.7	<DL
60	3C	612	750	402	<DL	<DL	24.5	<DL
60	3D	676	846	426	<DL	<DL	21.6	<DL
60	3E	1258.5	2160	304.5	n.d.	n.d.	27.45	n.d.
60	3F	617	2210	299	<DL	<DL	26.7	<DL
60	4A	324	175	422	<DL	5.06	2.61	<DL
60	4B	767	569	996	<DL	<DL	11.7	<DL
60	4C	976	1190	559	<DL	<DL	32.5	<DL
60	4D	945	1100	634	<DL	<DL	31.7	<DL
60	4E	956	2180	206	2.68	<DL	16.3	<DL
60	4F	535	2550	274	2.22	<DL	22.6	<DL
60	5A	54.4	131	106	6.91	<DL	2.18	0.528
60	5B	1950	1160	2000	2.56	4.47	21.5	<DL
60	5C	1060	1900	393	<DL	<DL	43	<DL
60	5D	997	1390	560	<DL	<DL	40.7	<DL
60	5E	1080	2230	253	<DL	<DL	21.3	<DL
60	5F	800	2700	318	<DL	<DL	24.3	<DL
60	6A	144	344	225	8.05	2.34	4.28	<DL
60	6B	970	590	1180	<DL	<DL	13.1	<DL
60	6C	1080	1210	742	<DL	<DL	37.1	<DL
60	6D	584	1140	180	<DL	<DL	31.9	<DL
60	6E	1010	2160	245	<DL	<DL	18.2	<DL
60	6F	689	2490	288	<DL	<DL	25.9	<DL
60	BCAL	2.61	100	<DL	15.4	<DL	<DL	<DL
60	BDOL	6.06	37.2	<DL	<DL	<DL	<DL	<DL
60	R1	<DL	<DL	<DL	<DL	<DL	<DL	<DL
63	1A	362	246	386	89.3	6.15	2.51	<DL
63	1B	795	964	650	44.7	3.71	10.2	<DL
63	1C	1000	1380	350	21.2	<DL	24.8	<DL
63	1D	1160	1350	549	4.01	<DL	25.7	<DL
63	1E	939	2060	184	4.2	<DL	19.4	<DL
63	1F	848	2730	294	3.77	<DL	23.2	<DL
63	2A	345	195	377	13.2	5.41	2.09	<DL
63	2B	1070	700	818	18.5	6.48	8.72	<DL
63	2C	1110	1460	222	4.73	<DL	25.8	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
63	2D	1390	1260	600	<DL	<DL	24.7	<DL
63	2E	984	2280	218	2.56	<DL	22.9	<DL
63	2F	1230	2550	357	3.13	<DL	26.7	<DL
63	3A	256	313	308	11.2	5.68	2.35	<DL
63	3B	520	356	436	4.53	<DL	5.68	<DL
63	3C	807	728	408	4.09	<DL	21.4	<DL
63	3D	839	850	403	5.9	<DL	17.2	<DL
63	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
63	3F	726	2360	275	3.37	<DL	27.2	<DL
63	4A	326	266	378	21	5.27	2.31	<DL
63	4B	938	596	938	12.1	<DL	7.61	<DL
63	4C	1410	1210	692	4.21	<DL	30.3	<DL
63	4D	1320	1240	742	<DL	<DL	28	<DL
63	4E	1270	2250	226	3.67	<DL	15.7	<DL
63	4F	698	2590	335	3.63	<DL	22.8	<DL
63	5A	47.4	234	93.9	7.41	<DL	1.71	0.464
63	5B	2040	1040	1650	7.07	4.49	16.6	<DL
63	5C	1750	1980	423	<DL	<DL	41.7	<DL
63	5D	1520	1480	655	<DL	<DL	37.3	<DL
63	5E	1360	2300	258	<DL	<DL	19.8	<DL
63	5F	982	2820	336	2.94	<DL	23.7	<DL
63	6A	239	428	231	6.85	3.31	5.92	<DL
63	6B	1150	607	1090	<DL	<DL	9.34	<DL
63	6C	1370	1120	754	<DL	<DL	30.7	<DL
63	6D	769	1120	181	<DL	<DL	27.7	<DL
63	6E	1270	2230	239	<DL	<DL	17.9	<DL
63	6F	837	2520	287	<DL	<DL	25.6	<DL
63	BCAL	0.976	249	2.53	45.1	<DL	<DL	<DL
63	BDOL	4.89	69.1	2.2	<DL	<DL	<DL	<DL
63	R2	9.34	31.1	0.897	<DL	<DL	<DL	<DL
67	1A	251	173	316	39.6	3.58	2.06	<DL
67	1B	833	755	686	23.4	4.13	11.1	<DL
67	1C	915	1530	349	11.8	<DL	23.5	<DL
67	1D	1290	1170	655	2.32	<DL	24.7	<DL
67	1E	895	2080	180	4.48	<DL	20.5	<DL
67	1F	765	2710	288	2.85	<DL	24.8	<DL
67	2A	368	230	389	38.8	5.69	2.24	<DL
67	2B	1050	688	803	12.3	6.44	8.32	<DL
67	2C	1170	1240	240	<DL	<DL	24.6	<DL
67	2D	1890	1680	634	<DL	<DL	33.2	<DL
67	2E	958	2450	225	<DL	<DL	24.6	<DL
67	2F	1120	2510	357	<DL	<DL	27.4	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
67	3A	266	351	318	18.6	4.61	2.39	<DL
67	3B	499	382	418	<DL	<DL	4.92	<DL
67	3C	823	723	480	<DL	<DL	18.4	<DL
67	3D	971	916	433	<DL	<DL	14.4	0.421
67	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
67	3F	676	2360	279	<DL	<DL	27.9	<DL
67	4A	398	306	417	5.38	6.14	2.25	<DL
67	4B	876	586	874	12.4	<DL	5.95	<DL
67	4C	1450	1150	810	9.6	<DL	27.6	<DL
67	4D	1520	1330	969	<DL	<DL	26.3	<DL
67	4E	1270	2270	237	<DL	<DL	15.2	<DL
67	4F	719	2620	332	<DL	<DL	24.7	<DL
67	5A	30.1	264	77.6	5.44	<DL	1.51	0.485
67	5B	1740	916	1450	4.08	4.29	13.8	<DL
67	5C	1860	1810	440	<DL	<DL	37.7	<DL
67	5D	1710	1440	768	<DL	<DL	34.1	<DL
67	5E	1390	2110	283	<DL	<DL	20.1	<DL
67	5F	1030	2570	389	<DL	<DL	25.7	<DL
67	6A	308	495	267	<DL	<DL	8.71	<DL
67	6B	1120	482	1150	<DL	2.58	5.22	<DL
67	6C	1680	1200	1080	<DL	<DL	30.8	<DL
67	6D	806	902	209	<DL	<DL	25.6	<DL
67	6E	1240	2040	254	<DL	<DL	18.2	<DL
67	6F	842	2410	332	<DL	<DL	28.6	<DL
67	BCAL	2.22	68.3	1.58	<DL	<DL	<DL	<DL
67	BDOL	5.11	<DL	1.17	<DL	<DL	<DL	<DL
67	R3	<DL	<DL	7.42	<DL	<DL	<DL	<DL
70	1A	205	150	270	98.2	4.11	1.8	<DL
70	1B	954	816	758	37.6	4.5	11.8	<DL
70	1C	927	1200	382	<DL	<DL	21.7	<DL
70	1D	1330	1040	745	<DL	<DL	20.4	<DL
70	1E	882	2060	182	<DL	<DL	20.6	<DL
70	1F	715	2570	287	<DL	<DL	24.2	<DL
70	2A	342	215	417	37.8	6.17	2.03	<DL
70	2B	934	611	740	6.53	6.61	7.3	<DL
70	2C	1260	1120	272	<DL	<DL	23	<DL
70	2D	1990	1720	687	<DL	<DL	30.5	<DL
70	2E	925	2320	231	<DL	<DL	24.5	<DL
70	2F	1060	2430	366	<DL	<DL	26.9	<DL
70	3A	294	405	357	9.03	6.89	2.85	<DL
70	3B	435	312	433	<DL	<DL	4.28	<DL
70	3C	797	608	506	<DL	<DL	14.6	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
70	3D	925	862	447	<DL	<DL	10.8	<DL
70	3E	1220	2350	208	<DL	<DL	32.8	<DL
70	3F	665	2190	299	<DL	<DL	27.2	<DL
70	4A	366	440	446	3.31	6.5	2.25	<DL
70	4B	776	496	767	2.48	<DL	4.92	<DL
70	4C	1430	1020	930	<DL	<DL	23.8	<DL
70	4D	1540	1150	1070	<DL	<DL	20.4	<DL
70	4E	1210	2170	234	<DL	<DL	13.8	<DL
70	4F	742	2530	366	<DL	<DL	24.3	<DL
70	5A	14	326	80.7	<DL	<DL	2.57	0.492
70	5B	1480	785	1290	45.2	3.95	10.9	<DL
70	5C	1900	1630	479	<DL	<DL	33.8	<DL
70	5D	1790	1320	885	<DL	<DL	28	<DL
70	5E	1420	2240	307	<DL	<DL	19.3	<DL
70	5F	985	2780	388	<DL	<DL	25.6	<DL
70	6A	121	236	140	<DL	2.36	2.88	<DL
70	6B	917	482	953	<DL	<DL	3.96	<DL
70	6C	1320	905	955	<DL	<DL	20	<DL
70	6D	787	960	198	<DL	<DL	23.2	<DL
70	6E	1200	2090	247	<DL	<DL	17.2	<DL
70	6F	776	2300	318	<DL	<DL	27.6	<DL
70	BCAL	0.394	31	<DL	6.18	<DL	<DL	<DL
70	BDOL	3.95	<DL	<DL	<DL	<DL	<DL	<DL
70	R4	11.9	<DL	<DL	<DL	<DL	<DL	<DL
74	1A	244	84.2	333	115	4.65	1.61	<DL
74	1B	739	562	610	4.65	3.02	10.4	<DL
74	1C	1020	1080	445	<DL	<DL	21	<DL
74	1D	1410	822	959	<DL	<DL	15.5	<DL
74	1E	873	1950	193	<DL	<DL	21.5	<DL
74	1F	652	2430	300	<DL	<DL	25.6	<DL
74	2A	341	102	431	41.4	6.81	2.01	<DL
74	2B	876	501	726	6.26	6.71	6.61	<DL
74	2C	1240	921	294	<DL	<DL	20.6	<DL
74	2D	2120	1470	830	<DL	<DL	27.2	<DL
74	2E	960	2240	262	<DL	<DL	25.6	<DL
74	2F	1030	2180	382	<DL	<DL	27.7	<DL
74	3A	250	155	315	11.9	5.04	1.92	<DL
74	3B	423	248	423	<DL	<DL	4.03	<DL
74	3C	782	518	520	<DL	<DL	12.2	<DL
74	3D	924	725	451	<DL	<DL	8.7	<DL
74	3E	1220	1890	239	<DL	<DL	30.1	<DL
74	3F	725	2070	361	<DL	<DL	28.1	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
74	4A	441	286	486	64	7.14	2.39	<DL
74	4B	759	405	784	5.53	<DL	4.56	<DL
74	4C	977	993	685	<DL	<DL	20.3	<DL
74	4D	1560	973	1240	<DL	<DL	15.3	<DL
74	4E	1270	2120	254	<DL	<DL	14	<DL
74	4F	880	2380	446	<DL	<DL	25.4	<DL
74	5A	11.9	126	83	4.22	<DL	1.12	0.544
74	5B	1360	671	1230	4.77	3.55	8.59	<DL
74	5C	2020	1390	533	<DL	<DL	30.4	<DL
74	5D	1870	1120	1050	<DL	<DL	22.5	<DL
74	5E	1510	2100	374	<DL	<DL	18	<DL
74	5F	1100	2530	442	<DL	<DL	26.7	<DL
74	6A	234	333	245	5.51	3.84	5.5	0.479
74	6B	849	373	913	<DL	<DL	3.73	<DL
74	6C	1270	761	1020	<DL	<DL	15.5	<DL
74	6D	865	776	248	<DL	<DL	22.8	<DL
74	6E	1210	1930	281	<DL	<DL	17.3	<DL
74	6F	818	2240	356	<DL	<DL	29.8	<DL
74	BCAL	0.349	<DL	<DL	<DL	<DL	<DL	<DL
74	BDOL	3.61	<DL	<DL	<DL	<DL	<DL	<DL
74	R5	<DL	<DL	<DL	<DL	<DL	<DL	<DL
77	1A	218	169	279	80.8	3.57	1.24	<DL
77	1B	960	788	737	113	3.88	11	<DL
77	1C	1050	1120	435	19.9	<DL	19.1	<DL
77	1D	1490	990	1010	22.9	<DL	9.44	<DL
77	1E	930	2080	197	6.11	<DL	20.8	<DL
77	1F	657	2460	298	3.63	<DL	24.7	<DL
77	2A	341	230	410	39.9	6.74	1.88	<DL
77	2B	825	547	624	17.5	5.33	5.76	<DL
77	2C	1380	985	330	<DL	<DL	19	<DL
77	2D	2300	1340	915	6.22	<DL	22.5	<DL
77	2E	1060	2340	280	2.64	<DL	25	<DL
77	2F	1100	2380	386	7.42	<DL	27.2	<DL
77	3A	224	244	268	21.7	4.21	1.74	<DL
77	3B	403	315	397	6.32	<DL	3.79	<DL
77	3C	800	571	484	6.08	<DL	10.8	<DL
77	3D	918	806	412	12.7	<DL	7.75	<DL
77	3E	1230	1870	243	7.68	<DL	28.3	<DL
77	3F	838	2120	405	3.82	<DL	26.7	<DL
77	4A	527	578	538	6.65	9.31	2.42	<DL
77	4B	713	472	660	3.83	<DL	4.15	<DL
77	4C	1380	923	947	3.68	<DL	18.4	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
77	4D	1560	1040	1200	2	<DL	11.7	<DL
77	4E	1330	2170	250	3.55	<DL	12.8	<DL
77	4F	1030	2460	452	5.66	<DL	23.9	<DL
77	5A	8.07	239	91.7	7.63	<DL	1.27	0.46
77	5B	1280	674	1080	2.25	3.39	6.1	<DL
77	5C	2210	1340	573	<DL	<DL	26.4	<DL
77	5D	1970	1130	1160	<DL	<DL	14.5	<DL
77	5E	1620	2140	375	2.24	<DL	15.7	<DL
77	5F	1230	2540	455	<DL	<DL	25.3	<DL
77	6A	186	370	181	6.58	2.28	4.46	<DL
77	6B	804	453	817	<DL	<DL	3.29	<DL
77	6C	1290	807	992	<DL	<DL	13.2	<DL
77	6D	914	855	254	<DL	<DL	19.1	<DL
77	6E	1330	1980	302	<DL	<DL	15.8	<DL
77	6F	890	2280	363	<DL	<DL	29.5	<DL
77	BCAL	<DL	94.7	<DL	<DL	<DL	<DL	<DL
77	BDOL	<DL	110	<DL	<DL	<DL	<DL	<DL
77	R6	<DL	23.4	<DL	<DL	<DL	<DL	<DL
82	1A	326	211	401	77.9	5.56	1.63	<DL
82	1B	1150	890	888	9.15	4.59	12.8	<DL
82	1C	1070	1160	467	2.5	<DL	18.8	<DL
82	1D	1420	919	1030	5.53	<DL	6.61	<DL
82	1E	936	2050	215	7.22	<DL	21.8	<DL
82	1F	664	2380	319	4.64	<DL	24.7	<DL
82	2A	365	252	429	19.7	6.61	1.88	<DL
82	2B	1030	675	780	14.1	6.75	6.47	<DL
82	2C	1510	1010	408	<DL	<DL	18.8	<DL
82	2D	2325	1605	1057.5	n.d.	n.d.	15.75	n.d.
82	2E	1130	2320	340	3.77	<DL	25.5	<DL
82	2F	1080	2170	407	2.34	<DL	26.3	<DL
82	3A	247	288	296	6.97	4.48	1.8	<DL
82	3B	401	315	397	<DL	<DL	3.76	<DL
82	3C	755	582	464	<DL	<DL	10	<DL
82	3D	885	839	398	<DL	<DL	6.24	<DL
82	3E	1140	1850	237	2.11	<DL	28	<DL
82	3F	958	2040	470	<DL	<DL	23.1	<DL
82	4A	324	275	395	25.1	5.28	1.8	<DL
82	4B	746	520	695	8.41	<DL	4.18	<DL
82	4C	1290	892	907	4.35	<DL	14.1	<DL
82	4D	1480	1060	1170	13.3	<DL	8.71	<DL
82	4E	1330	2210	257	4.01	<DL	13.1	<DL
82	4F	1160	2380	492	2.59	<DL	20.7	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
82	5A	10.5	13500	68.9	453	<DL	1.46	0.531
82	5B	1110	646	947	7.71	3.17	5.26	<DL
82	5C	2170	1210	641	<DL	<DL	22.7	<DL
82	5D	1860	1050	1210	<DL	<DL	10.6	<DL
82	5E	1550	2120	381	<DL	<DL	14.7	<DL
82	5F	1250	2460	475	<DL	<DL	23.7	<DL
82	6A	334	785	262	2.37	<DL	9.03	<DL
82	6B	740	452	747	<DL	<DL	3.39	<DL
82	6C	1060	732	843	<DL	<DL	10.9	<DL
82	6D	880	793	273	<DL	<DL	16	<DL
82	6E	1260	1950	316	<DL	<DL	13.9	<DL
82	6F	945	2220	404	<DL	<DL	28.8	<DL
82	BCAL	<DL	96.8	0.454	<DL	<DL	<DL	<DL
82	BDOL	<DL	114	<DL	<DL	<DL	<DL	<DL
82	R1	<DL	25.8	<DL	<DL	<DL	<DL	<DL
84	1A	259	165	339	<DL	4.87	1.55	<DL
84	1B	975	776	847	<DL	6.35	11.3	<DL
84	1C	1210	1080	642	<DL	<DL	18.7	<DL
84	1D	1520	890	1250	<DL	<DL	7.14	<DL
84	1E	1050	2180	243	<DL	<DL	24	<DL
84	1F	734	2460	351	<DL	<DL	27.6	<DL
84	2A	299	189	381	<DL	5.69	1.91	<DL
84	2B	842	563	765	<DL	5.32	5.88	<DL
84	2C	1660	998	503	<DL	<DL	19.1	<DL
84	2D	1870	1020	1090	<DL	2.16	11.5	<DL
84	2E	1260	2460	367	<DL	<DL	26.6	<DL
84	2F	1170	2290	444	<DL	<DL	29.6	<DL
84	3A	244	251	296	<DL	4.85	1.97	<DL
84	3B	390	303	381	<DL	<DL	4.28	<DL
84	3C	786	571	546	<DL	<DL	10	<DL
84	3D	1010	729	433	<DL	<DL	7.25	<DL
84	3E	1170	1950	253	<DL	<DL	29.2	<DL
84	3F	1130	2190	571	<DL	<DL	25	<DL
84	4A	399	251	500	<DL	6.93	1.85	<DL
84	4B	662	456	739	<DL	<DL	4.17	<DL
84	4C	1350	906	1050	<DL	<DL	13.5	<DL
84	4D	1500	1050	1290	<DL	<DL	9.37	<DL
84	4E	1420	2430	268	<DL	<DL	14.4	<DL
84	4F	1330	2510	610	<DL	<DL	22.8	<DL
84	5A	9.5	245	95.6	<DL	<DL	2.05	0.571
84	5B	934	578	902	<DL	2.61	5.78	<DL
84	5C	2130	1170	796	<DL	<DL	20.9	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
84	5D	1830	1020	1380	<DL	<DL	10.9	<DL
84	5E	1610	2240	384	<DL	<DL	15.3	<DL
84	5F	1290	2650	548	<DL	<DL	25.3	<DL
84	6A	187	402	204	<DL	2.4	3.52	<DL
84	6B	637	431	771	<DL	<DL	3.28	<DL
84	6C	1020	744	895	<DL	<DL	10.4	<DL
84	6D	962	798	311	<DL	<DL	17.3	<DL
84	6E	1300	2150	321	<DL	<DL	14.6	<DL
84	6F	1010	2410	425	<DL	<DL	32.3	<DL
84	BCAL	<DL	83.7	<DL	<DL	<DL	<DL	<DL
84	BDOL	0.818	41.1	<DL	<DL	<DL	<DL	<DL
84	R2	<DL	7.14	<DL	<DL	<DL	<DL	<DL
88	1A	391	260	493	<DL	7.03	2.18	<DL
88	1B	836	763	765	<DL	3.67	10.1	<DL
88	1C	1180	1170	703	<DL	<DL	17.5	<DL
88	1D	1510	1130	1330	<DL	<DL	6.56	<DL
88	1E	1070	2330	273	<DL	<DL	23.5	<DL
88	1F	761	2620	376	<DL	<DL	27	<DL
88	2A	361	301	455	<DL	6.73	2.14	<DL
88	2B	653	535	607	<DL	4.5	5.15	<DL
88	2C	1470	976	504	<DL	<DL	15.7	<DL
88	2D	2085	1710	1236	n.d.	n.d.	9.855	n.d.
88	2E	1350	2600	400	<DL	<DL	24.8	<DL
88	2F	1140	2510	435	<DL	<DL	27.8	<DL
88	3A	273	606	322	<DL	4.85	2.06	<DL
88	3B	394	332	386	<DL	<DL	3.98	<DL
88	3C	777	624	525	<DL	56.6	9.67	<DL
88	3D	952.5	1545	423	n.d.	n.d.	6.36	n.d.
88	3E	1170	2110	261	<DL	<DL	28.9	<DL
88	3F	1300	2380	673	<DL	<DL	19.9	<DL
88	4A	559.5	433.5	679.5	n.d.	9.825	2.91	n.d.
88	4B	645	497	729	<DL	<DL	4.32	<DL
88	4C	1130	941	854	<DL	<DL	11.6	<DL
88	4D	1420	1130	1220	<DL	<DL	10.3	<DL
88	4E	1500	2690	294	<DL	<DL	14.5	<DL
88	4F	1510	2730	676	<DL	<DL	19	<DL
88	5A	1.57	489	101	<DL	<DL	3.77	0.652
88	5B	958	686	902	<DL	3.05	5.57	<DL
88	5C	1840	1200	789	<DL	<DL	17.2	<DL
88	5D	1530	1170	1210	<DL	<DL	9.51	<DL
88	5E	1610	2370	388	<DL	<DL	14.9	<DL
88	5F	1500	2860	630	<DL	<DL	23.9	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
88	6A	198	583	219	<DL	3.77	3.03	<DL
88	6B	658	492	785	<DL	<DL	3.17	<DL
88	6C	1010	834	876	<DL	<DL	10.1	<DL
88	6D	994	820	348	<DL	<DL	14.6	<DL
88	6E	1350	2290	345	<DL	<DL	13.9	<DL
88	6F	1180	2440	490	<DL	<DL	30.9	<DL
88	BCAL	<DL	88.5	<DL	<DL	<DL	<DL	<DL
88	BDOL	1.32	78.5	<DL	<DL	<DL	<DL	<DL
88	R3	<DL	19.8	<DL	<DL	<DL	<DL	<DL
91	1A	881	396	975	26.5	16.5	3.13	<DL
91	1B	752	642	716	10	3.06	8.29	<DL
91	1C	1130	956	729	<DL	<DL	14.5	<DL
91	1D	1320	861	1220	<DL	<DL	5.17	<DL
91	1E	1030	2000	293	<DL	<DL	19.6	<DL
91	1F	788	2150	428	<DL	<DL	22.5	<DL
91	2A	329	238	438	6.16	7.84	2.02	<DL
91	2B	592	446	572	<DL	4.27	4.56	<DL
91	2C	1290	757	494	<DL	<DL	12.3	<DL
91	2D	2535	1453.5	1575	n.d.	n.d.	11.265	n.d.
91	2E	1310	2200	368	<DL	<DL	21.1	<DL
91	2F	1060	2010	426	<DL	<DL	23.1	<DL
91	3A	199	240	257	2.15	3.87	1.67	<DL
91	3B	392	315	400	<DL	<DL	3.78	<DL
91	3C	762	579	525	<DL	<DL	9.05	<DL
91	3D	601	559	276	<DL	<DL	4.11	<DL
91	3E	1120	1910	271	<DL	<DL	26.1	<DL
91	3F	1280	2200	647	<DL	<DL	18.5	<DL
91	4A	467	449	589	13.6	7.39	2.14	<DL
91	4B	634	454	730	3.14	<DL	3.61	<DL
91	4C	1030	787	797	<DL	<DL	9.58	<DL
91	4D	1190	960	1040	<DL	<DL	7.16	<DL
91	4E	1420	2400	290	<DL	<DL	13	<DL
91	4F	1600	2440	732	<DL	<DL	13.2	<DL
91	5A	1.85	353	96.4	3.09	<DL	2.1	0.69
91	5B	852	603	855	3.57	2.48	4.99	<DL
91	5C	1650	992	752	<DL	<DL	13.7	<DL
91	5D	1310	885	1080	<DL	<DL	7.96	<DL
91	5E	1590	2140	402	<DL	<DL	13.4	<DL
91	5F	1440	2410	623	<DL	<DL	20.2	<DL
91	6A	228	565	239	3.44	2.04	3.38	<DL
91	6B	631	443	765	<DL	<DL	3.17	<DL
91	6C	918	703	855	<DL	<DL	8.39	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
91	6D	908	721	357	<DL	<DL	12	<DL
91	6E	1250	1890	333	<DL	<DL	12.1	<DL
91	6F	1220	2160	510	<DL	<DL	26.4	<DL
91	BCAL	<DL	153	0.7	8.92	<DL	<DL	<DL
91	BDOL	<DL	108	<DL	<DL	<DL	<DL	<DL
91	R4	<DL	24.5	1.95	<DL	<DL	<DL	<DL
95	1A	911	490	1020	51.9	15.1	4.36	<DL
95	1B	795	725	758	16.7	3.51	8.62	<DL
95	1C	1170	1050	787	3.93	<DL	14.2	<DL
95	1D	1390	1030	1380	2.65	<DL	6.45	<DL
95	1E	1170	2160	346	2.93	<DL	20.2	<DL
95	1F	917	2440	526	2.54	<DL	22.9	<DL
95	2A	364	280	490	10.5	7.18	2.4	<DL
95	2B	602	545	578	4.28	4.09	4.51	<DL
95	2C	1400	889	598	<DL	<DL	12.5	<DL
95	2D	2025	1500	1318.5	n.d.	n.d.	9.78	n.d.
95	2E	1530	2440	408	<DL	<DL	21.2	<DL
95	2F	1150	2190	463	<DL	<DL	22.3	<DL
95	3A	234	312	299	2.32	4.29	1.85	<DL
95	3B	387	337	401	2.76	<DL	4.2	<DL
95	3C	737	557	510	<DL	<DL	8.38	<DL
95	3D	870	958.5	448.5	n.d.	n.d.	5.94	n.d.
95	3E	1020	1840	261	<DL	<DL	24.1	<DL
95	3F	1230	1930	646	<DL	<DL	14.8	<DL
95	4A	616	539	763	21.1	10.4	12.9	<DL
95	4B	660	497	743	<DL	<DL	4.1	<DL
95	4C	1000	814	800	<DL	<DL	9.56	<DL
95	4D	1250	1040	1080	<DL	<DL	7.32	<DL
95	4E	1490	2430	318	<DL	<DL	14.2	<DL
95	4F	1550	2290	672	<DL	<DL	10.4	<DL
95	5A	n.d.	493.5	84.6	n.d.	n.d.	2.46	n.d.
95	5B	795	594	821	<DL	2.56	4.79	<DL
95	5C	1480	954	740	<DL	<DL	12.1	<DL
95	5D	1190	883	997	<DL	<DL	7	<DL
95	5E	1530	2030	395	<DL	<DL	13	<DL
95	5F	1440	2320	624	<DL	<DL	17.1	<DL
95	6A	291	813	222	n.d.	n.d.	6.3	n.d.
95	6B	661	505	799	<DL	<DL	3.19	<DL
95	6C	904	717	825	<DL	<DL	8.23	<DL
95	6D	902	783	394	<DL	<DL	10.6	<DL
95	6E	1230	1970	332	<DL	<DL	11.9	<DL
95	6F	1300	2080	545	<DL	<DL	22.2	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
95	BCAL	<DL	90.3	2.04	<DL	<DL	<DL	<DL
95	BDOL	0.861	101	1.52	<DL	<DL	<DL	<DL
95	R5	<DL	39.9	1.07	<DL	<DL	<DL	<DL
98	1A	710	436	918	19.1	8.69	3.79	<DL
98	1B	796	562	824	<DL	2.32	7.95	<DL
98	1C	1420	980	974	<DL	<DL	15.3	<DL
98	1D	1410	858	1400	<DL	<DL	5.8	<DL
98	1E	1440	1990	437	<DL	<DL	21.7	<DL
98	1F	1090	2040	648	<DL	<DL	20.4	<DL
98	2A	365	280	521	9.75	5.16	2.11	<DL
98	2B	595	400	595	<DL	2.75	4.36	<DL
98	2C	1660	831	772	<DL	<DL	12.1	<DL
98	2D	1920	1264.5	1345.5	n.d.	n.d.	7.245	n.d.
98	2E	1800	2080	462	<DL	<DL	22.2	<DL
98	2F	1310	1960	532	<DL	<DL	23.4	<DL
98	3A	235	343	319	<DL	3.2	2.2	<DL
98	3B	429	291	454	<DL	<DL	4.26	<DL
98	3C	884	499	637	<DL	<DL	9.32	<DL
98	3D	928.5	1405.5	468	n.d.	n.d.	5.265	n.d.
98	3E	1140	1650	317	<DL	<DL	25.9	<DL
98	3F	1430	1840	758	<DL	<DL	16.4	<DL
98	4A	464	642	629	<DL	5.44	2.62	<DL
98	4B	695	570	826	<DL	<DL	3.92	<DL
98	4C	1190	730	941	<DL	<DL	10.3	<DL
98	4D	1430	998	1250	<DL	<DL	8.03	<DL
98	4E	1710	2200	380	<DL	<DL	15	<DL
98	4F	1900	2110	788	<DL	<DL	11.3	<DL
98	5A	2.74	429	93	<DL	<DL	1.57	<DL
98	5B	819	482	879	<DL	<DL	4.19	<DL
98	5C	1560	781	837	<DL	<DL	11.5	<DL
98	5D	1320	814	1100	<DL	2.18	7.49	<DL
98	5E	1820	1910	472	<DL	<DL	14.7	<DL
98	5F	1750	2220	742	<DL	<DL	18.4	<DL
98	6A	252	685	214	<DL	<DL	5.69	<DL
98	6B	741	411	902	<DL	<DL	3.47	<DL
98	6C	1110	688	952	<DL	<DL	9.43	<DL
98	6D	1010	667	440	<DL	<DL	10.7	<DL
98	6E	1390	1780	394	<DL	<DL	13.1	<DL
98	6F	1540	1830	646	<DL	<DL	21.7	<DL
98	BCAL	<DL	56.3	0.635	<DL	<DL	<DL	<DL
98	BDOL	4.55	75.1	0.665	<DL	<DL	<DL	<DL
98	R6	<DL	<DL	<DL	<DL	<DL	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
103	1A	767	319	913	27.4	7.92	3.4	<DL
103	1B	861	669	869	2.48	2.44	7.8	<DL
103	1C	1310	924	921	<DL	<DL	12.8	<DL
103	1D	1356	996	1399.5	n.d.	n.d.	6.195	n.d.
103	1E	1640	1990	493	<DL	<DL	19.7	<DL
103	1F	1250	2100	743	<DL	<DL	14.7	<DL
103	2A	398	266	576	19.9	4.82	2.31	<DL
103	2B	597	375	588	<DL	2.2	3.9	<DL
103	2C	1500	761	751	<DL	<DL	9.44	<DL
103	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
103	2E	1980	2100	479	<DL	<DL	20.1	<DL
103	2F	1310	1890	521	<DL	<DL	20.7	<DL
103	3A	206	189	288	<DL	2.36	2.02	<DL
103	3B	482	299	503	<DL	<DL	4.01	<DL
103	3C	941	538	651	<DL	<DL	9.94	<DL
103	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
103	3E	1220	1760	357	<DL	<DL	26.7	<DL
103	3F	1500	1790	821	<DL	<DL	14.6	<DL
103	4A	685.5	622.5	934.5	26.25	7.02	3.81	n.d.
103	4B	753	449	852	<DL	<DL	4.14	<DL
103	4C	1120	804	872	<DL	4.15	9.72	<DL
103	4D	1370	1010	1190	<DL	<DL	7.77	<DL
103	4E	1760	2280	394	<DL	<DL	14.9	<DL
103	4F	1930	2110	787	<DL	<DL	10.6	<DL
103	5A	1.62	306	84.2	<DL	<DL	1.71	0.447
103	5B	828	503	901	<DL	<DL	4.5	<DL
103	5C	1430	766	797	<DL	<DL	10.4	<DL
103	5D	1230	804	1050	<DL	<DL	7.11	<DL
103	5E	1810	1860	467	<DL	<DL	13.7	<DL
103	5F	1760	2110	728	<DL	<DL	14.5	<DL
103	6A	313	509	212	<DL	<DL	7.3	<DL
103	6B	742	442	909	<DL	<DL	3.65	<DL
103	6C	1040	651	885	<DL	<DL	8.24	<DL
103	6D	1060	686	479	<DL	<DL	9.41	<DL
103	6E	1350	1700	390	<DL	<DL	12.2	<DL
103	6F	1640	1830	663	<DL	<DL	16.8	<DL
103	BCAL	0.274	117	0.875	24.6	<DL	<DL	<DL
103	BDOL	3.17	59.4	0.48	<DL	<DL	<DL	<DL
103	R1	<DL	<DL	<DL	<DL	<DL	<DL	<DL
105	1A	585	356	744	44.6	11.5	2.38	<DL
105	1B	656	558	670	22.5	2.9	6.04	<DL
105	1C	1250	1090	862	11.9	<DL	12.5	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
105	1D	1280	939	1280	<DL	<DL	5.38	<DL
105	1E	1490	2090	421	<DL	<DL	17.9	<DL
105	1F	1070	2130	598	<DL	<DL	13	<DL
105	2A	257	213	375	30.8	7.02	1.68	<DL
105	2B	534	459	521	13.2	4.02	3.85	<DL
105	2C	1260	771	640	<DL	<DL	7.96	<DL
105	2D	1630	1020	1100	<DL	<DL	6.27	<DL
105	2E	1780	2180	397	<DL	<DL	19.1	<DL
105	2F	1290	2290	491	3.45	<DL	21.7	<DL
105	3A	139	192	190	105	3.86	1.7	<DL
105	3B	381	326	391	58.1	<DL	3.98	<DL
105	3C	853	589	564	2.7	<DL	8.97	<DL
105	3D	1020	724	528	2.06	<DL	5.96	<DL
105	3E	955	1790	282	<DL	<DL	23	<DL
105	3F	1230	1950	628	<DL	<DL	15.4	<DL
105	4A	607	454	775	5.99	13.5	3.04	<DL
105	4B	581	452	693	7.07	<DL	3.6	<DL
105	4C	995	794	781	<DL	<DL	9.04	<DL
105	4D	1210	952	979	<DL	<DL	6.96	<DL
105	4E	1580	2410	337	<DL	<DL	13.8	<DL
105	4F	1750	2170	631	<DL	<DL	9.84	<DL
105	5A	<DL	253	75.6	<DL	<DL	<DL	0.451
105	5B	600	470	686	<DL	2.08	3.4	<DL
105	5C	1270	1100	715	<DL	<DL	9.54	<DL
105	5D	1010	775	834	<DL	<DL	6.05	<DL
105	5E	1500	1940	375	<DL	<DL	12.2	<DL
105	5F	1410	2100	567	<DL	<DL	13.5	<DL
105	6A	182	403	146	<DL	2.01	3.92	<DL
105	6B	566	436	728	<DL	<DL	3.33	<DL
105	6C	1000	791	835	<DL	<DL	8.15	<DL
105	6D	940	715	428	<DL	<DL	8.73	<DL
105	6E	1130	1810	312	<DL	<DL	11	<DL
105	6F	1380	1870	514	<DL	<DL	15.4	<DL
105	BCAL	<DL	66	<DL	<DL	<DL	<DL	<DL
105	BDOL	<DL	65.6	<DL	<DL	<DL	<DL	<DL
105	R2	<DL	26.3	<DL	<DL	<DL	<DL	<DL
109	1A	480	288	637	78.8	8.76	3.16	<DL
109	1B	659	579	663	14.7	3.18	5.77	<DL
109	1C	970.5	822	795	n.d.	n.d.	9.855	n.d.
109	1D	1170	1000	1150	<DL	<DL	5.59	<DL
109	1E	1540	2090	432	<DL	<DL	16.8	<DL
109	1F	1050	2200	571	<DL	<DL	11.2	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
109	2A	265	268	388	22.2	7.29	1.94	<DL
109	2B	489	421	480	9.51	3.57	3.59	<DL
109	2C	1170	754	612	<DL	<DL	7.53	<DL
109	2D	1407	1725	1078.5	n.d.	n.d.	5.055	n.d.
109	2E	1850	2150	397	<DL	<DL	17.2	<DL
109	2F	1150	2010	430	<DL	<DL	18.9	<DL
109	3A	135	201	182	<DL	2.89	1.34	<DL
109	3B	383	340	394	<DL	<DL	3.6	<DL
109	3C	887	575	577	<DL	<DL	9.07	<DL
109	3D	912	755	482	<DL	<DL	5.67	<DL
109	3E	883	1830	281	<DL	<DL	22.3	<DL
109	3F	1210	1960	617	<DL	<DL	15.3	<DL
109	4A	507	448	671	2.33	11.4	2.76	<DL
109	4B	583	459	697	<DL	<DL	3.56	<DL
109	4C	949	821	759	<DL	<DL	8.45	<DL
109	4D	1200	1010	976	<DL	<DL	7.25	<DL
109	4E	1600	2420	353	<DL	<DL	13.7	<DL
109	4F	1720	2160	603	<DL	<DL	9.86	<DL
109	5A	0.594	364.5	75.3	n.d.	n.d.	1.8	n.d.
109	5B	594	475	682	<DL	2.09	3.37	<DL
109	5C	1140	803	673	<DL	<DL	8.65	<DL
109	5D	917	810	786	<DL	<DL	5.72	<DL
109	5E	1490	1890	373	<DL	<DL	11.7	<DL
109	5F	1400	2120	539	<DL	<DL	12.4	<DL
109	6A	179	452	151	<DL	2.7	4.08	<DL
109	6B	596	481	741	<DL	<DL	3.02	<DL
109	6C	883	690	750	<DL	<DL	6.84	<DL
109	6D	963	768	443	<DL	<DL	7.97	<DL
109	6E	1110	1780	307	<DL	<DL	10.8	<DL
109	6F	1370	1810	490	<DL	<DL	13.4	<DL
109	BCAL	<DL	79.2	0.833	<DL	<DL	<DL	<DL
109	BDOL	<DL	80.8	0.455	<DL	<DL	<DL	<DL
109	R3	<DL	21.3	<DL	<DL	<DL	<DL	<DL
112	1A	605	1500	787	142	15.1	3.12	0.613
112	1B	684	538	707	27.1	2.61	6.04	<DL
112	1C	1020	780	844	14.1	<DL	10.5	<DL
112	1D	1250	934	1210	<DL	<DL	5.61	<DL
112	1E	1710	1950	485	<DL	<DL	17.3	<DL
112	1F	1090	2040	583	<DL	<DL	11.7	<DL
112	2A	257	586	382	21.4	5.5	2.02	<DL
112	2B	708	468	724	4.55	4.88	4.37	<DL
112	2C	1230	693	702	<DL	<DL	7.01	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
112	2D	1600	1100	1240	<DL	<DL	6.57	<DL
112	2E	1910	1850	395	<DL	<DL	16.3	<DL
112	2F	1170	1810	432	<DL	<DL	18.9	<DL
112	3A	149	207	199	<DL	3.58	1.43	<DL
112	3B	359	268	378	<DL	<DL	3.76	<DL
112	3C	952	496	619	<DL	<DL	9.3	<DL
112	3D	916	717	532	<DL	<DL	4.85	<DL
112	3E	847	1670	284	<DL	<DL	22.9	<DL
112	3F	1170	1720	573	<DL	<DL	16.5	<DL
112	4A	284	221	391	<DL	5.28	2.19	<DL
112	4B	690	468	815	<DL	<DL	4.24	<DL
112	4C	979	724	836	<DL	<DL	8.7	<DL
112	4D	1240	978	1030	<DL	<DL	7.31	<DL
112	4E	1690	2330	380	<DL	<DL	14.7	<DL
112	4F	1670	1950	595	<DL	<DL	9.69	<DL
112	5A	<DL	406	85.4	<DL	<DL	2.04	0.79
112	5B	580	437	687	<DL	2	4.08	<DL
112	5C	1160	732	704	<DL	<DL	9	<DL
112	5D	958	738	859	<DL	<DL	6.18	<DL
112	5E	1470	1690	363	<DL	<DL	11.8	<DL
112	5F	1260	1770	491	<DL	<DL	11.8	<DL
112	6A	349	582	182	<DL	<DL	7.37	<DL
112	6B	562	404	749	<DL	<DL	3.17	<DL
112	6C	868	622	802	<DL	<DL	7.28	<DL
112	6D	964	637	463	<DL	<DL	7.43	<DL
112	6E	1100	1620	306	<DL	<DL	10.9	<DL
112	6F	1420	1640	491	<DL	<DL	13.8	<DL
112	BCAL	<DL	58.3	0.741	<DL	<DL	<DL	<DL
112	BDOL	<DL	53.4	<DL	<DL	<DL	<DL	<DL
112	R4	<DL	<DL	2	<DL	<DL	<DL	<DL
116	1A	565	334	755	119	9.61	2.57	<DL
116	1B	687	525	717	27.6	3.19	5.59	<DL
116	1C	983	795	795	19.3	<DL	9.86	<DL
116	1D	1130	888	1070	<DL	<DL	5	<DL
116	1E	1780	2000	517	<DL	<DL	16.6	<DL
116	1F	1020	2010	537	<DL	<DL	10.6	<DL
116	2A	212	214	324	18.5	4.94	1.7	<DL
116	2B	523	392	540	<DL	3.24	3.41	<DL
116	2C	1210	719	728	<DL	<DL	6.47	<DL
116	2D	1200	1410	1020	<DL	<DL	4.36	<DL
116	2E	2040	1860	423	<DL	<DL	15.8	<DL
116	2F	1100	1790	402	<DL	<DL	17.1	<DL

Table 13: cont

		Element, Unit, Detection Limit						
Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
116	3A	141	160	173	<DL	2.51	1.3	<DL
116	3B	381	280	402	<DL	<DL	3.55	<DL
116	3C	975	515	647	<DL	<DL	8.88	<DL
116	3D	1030	812	588	<DL	<DL	5.36	<DL
116	3E	839	1740	293	<DL	<DL	23.2	<DL
116	3F	1230	1790	594	<DL	<DL	15.7	<DL
116	4A	205	143	286	<DL	3.31	1.51	<DL
116	4B	674	433	804	<DL	<DL	3.69	<DL
116	4C	972	749	815	<DL	<DL	8.37	<DL
116	4D	1180	956	927	118	<DL	6.86	<DL
116	4E	1680	2160	379	<DL	<DL	13.9	<DL
116	4F	1680	1940	593	<DL	<DL	9.84	<DL
116	5A	<DL	377	79.1	<DL	<DL	2.27	0.649
116	5B	594	420	691	<DL	<DL	3.55	<DL
116	5C	1090	724	681	<DL	<DL	8.27	<DL
116	5D	882	708	831	<DL	<DL	5.32	<DL
116	5E	1470	1640	362	<DL	<DL	11.4	<DL
116	5F	1290	1830	488	<DL	<DL	10.9	<DL
116	6A	317	474	156	<DL	<DL	5.4	<DL
116	6B	532	401	722	<DL	<DL	3.15	<DL
116	6C	816	595	759	<DL	<DL	6.58	<DL
116	6D	968	627	469	<DL	<DL	6.23	<DL
116	6E	1050	1530	301	<DL	<DL	10.2	<DL
116	6F	1340	1510	452	<DL	<DL	11.6	<DL
116	BCAL	<DL	69.8	0.566	<DL	<DL	<DL	<DL
116	BDOL	<DL	47.6	<DL	<DL	<DL	<DL	<DL
116	R5	<DL	<DL	<DL	<DL	<DL	<DL	<DL
119	1A	648	424	806	41.8	13	2.7	<DL
119	1B	701	542	709	20.5	3.17	5.45	<DL
119	1C	1010	851	796	14.8	<DL	9.89	<DL
119	1D	1160	977	1060	2.26	<DL	5.13	<DL
119	1E	1860	2100	527	7.48	<DL	16.3	<DL
119	1F	1090	2170	537	3.5	<DL	11.8	<DL
119	2A	227	236	343	22.2	5.77	1.71	<DL
119	2B	461	402	465	16.2	3.31	3.31	<DL
119	2C	1170	708	700	<DL	<DL	6.33	<DL
119	2D	1530	1320	1210	<DL	<DL	5.53	<DL
119	2E	2240	2060	435	2.5	<DL	16.5	<DL
119	2F	1160	1860	403	2.43	<DL	17.1	<DL
119	3A	147	257	187	13.9	3.49	1.36	<DL
119	3B	368	334	377	11.6	<DL	3.92	<DL
119	3C	957	532	631	6.06	<DL	8.53	<DL

Table 13: cont

		Element, Unit, Detection Limit						
Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
119	3D	1020	841	600	6.45	<DL	5.85	<DL
119	3E	820	1960	287	8.16	<DL	24	<DL
119	3F	1160	1780	532	3.28	<DL	16.1	<DL
119	4A	189	242	267	5.12	3.63	2.8	<DL
119	4B	608	435	728	2.78	<DL	3.78	<DL
119	4C	1030	790	825	<DL	<DL	8.63	<DL
119	4D	1210	977	942	<DL	<DL	6.66	<DL
119	4E	1680	2210	376	2.21	<DL	13.8	<DL
119	4F	1730	2010	602	2.66	<DL	10.2	<DL
119	5A	<DL	206	333	5.66	<DL	<DL	<DL
119	5B	585	454	679	3.75	<DL	3.94	<DL
119	5C	1080	765	683	<DL	<DL	8.38	<DL
119	5D	874	769	809	<DL	<DL	5.35	<DL
119	5E	1480	1720	356	<DL	<DL	11.6	<DL
119	5F	1240	1850	453	<DL	<DL	11.1	<DL
119	6A	201	461	145	3.78	2.02	3.3	<DL
119	6B	492	413	661	<DL	<DL	2.96	<DL
119	6C	809	645	725	<DL	<DL	6.64	<DL
119	6D	997	699	464	<DL	<DL	6.35	<DL
119	6E	1070	1670	293	<DL	<DL	10.6	<DL
119	6F	1390	1600	443	<DL	<DL	11.8	<DL
119	BCAL	<DL	191	0.49	<DL	<DL	<DL	<DL
119	BDOL	<DL	71.5	<DL	<DL	<DL	<DL	<DL
119	R6	<DL	13.2	<DL	<DL	<DL	<DL	<DL
123	1A	765	671	1060	148	12.7	3.83	<DL
123	1B	763	581	764	58.4	3.29	5.99	<DL
123	1C	940	780	773	6.46	<DL	9.1	<DL
123	1D	1270	1080	1160	11.7	<DL	5.8	<DL
123	1E	1830	2070	546	15.2	<DL	15.1	<DL
123	1F	1150	2190	548	9.76	<DL	12	<DL
123	2A	248	701	379	46.6	7.65	2.06	<DL
123	2B	614	518	662	21.4	4.6	4.01	<DL
123	2C	1030	668	643	7.99	<DL	6.08	<DL
123	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
123	2E	2310	1950	453	5.43	<DL	16.2	<DL
123	2F	1170	1950	397	3.37	<DL	17	<DL
123	3A	145	283	193	8.97	3.26	1.38	<DL
123	3B	402	326	423	4.94	<DL	3.97	<DL
123	3C	1020	549	686	6.11	<DL	8.87	<DL
123	3D	951	934	631	2.52	<DL	5.91	<DL
123	3E	807	1970	295	<DL	<DL	25	<DL
123	3F	1220	1770	544	<DL	<DL	16.9	<DL

Table 13: cont

		Element, Unit, Detection Limit						
Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
123	4A	229	461	325	2.81	4.26	2.57	<DL
123	4B	623	462	738	<DL	<DL	3.83	<DL
123	4C	1000	761	817	<DL	<DL	8.24	<DL
123	4D	1200	981	965	<DL	<DL	6.77	<DL
123	4E	1880	2320	423	2.76	<DL	14.8	<DL
123	4F	1740	1990	589	<DL	<DL	10.6	<DL
123	5A	<DL	806	64.8	4.76	<DL	1.91	0.507
123	5B	596	479	686	8.82	<DL	4.56	<DL
123	5C	1080	711	708	<DL	<DL	8.04	<DL
123	5D	837	780	816	<DL	<DL	5.24	<DL
123	5E	1370	1610	331	<DL	<DL	11	<DL
123	5F	1190	1740	426	<DL	<DL	10.8	<DL
123	6A	195	447	130	4.85	2.11	3.22	<DL
123	6B	503	418	684	<DL	<DL	3.06	<DL
123	6C	809	662	748	<DL	<DL	7.08	<DL
123	6D	1010	723	470	<DL	<DL	5.89	<DL
123	6E	1080	1690	303	<DL	<DL	11.1	<DL
123	6F	1280	1480	398	<DL	<DL	10.7	<DL
123	BCAL	<DL	61.5	0.681	<DL	<DL	<DL	<DL
123	BDOL	<DL	74.6	<DL	<DL	<DL	<DL	<DL
123	R1	<DL	15	<DL	<DL	<DL	<DL	<DL
126	1A	797	660	1170	42.2	19.3	5.7	<DL
126	1B	670	508	724	8.86	3.13	5.46	<DL
126	1C	921	714	821	<DL	<DL	9.18	<DL
126	1D	1130	900	1080	<DL	<DL	5.29	<DL
126	1E	1870	1990	575	<DL	<DL	16.1	<DL
126	1F	1110	2030	540	<DL	<DL	12.7	<DL
126	2A	197	222	326	31.6	6.08	1.8	<DL
126	2B	483	373	540	4.62	3.57	3.38	<DL
126	2C	1030	608	694	<DL	<DL	5.94	<DL
126	2D	1180	878	925	<DL	<DL	5.8	<DL
126	2E	2360	1830	495	<DL	<DL	15.8	<DL
126	2F	1100	1630	398	<DL	<DL	16.1	<DL
126	3A	137	200	180	<DL	3.31	1.41	<DL
126	3B	359	418	402	<DL	<DL	3.6	<DL
126	3C	952	480	687	<DL	<DL	7.93	<DL
126	3D	886	933	653	<DL	<DL	5.36	<DL
126	3E	767	1840	295	<DL	<DL	24.8	<DL
126	3F	1290	1760	578	<DL	<DL	19	<DL
126	4A	208	293	308	3.67	4.35	2.04	<DL
126	4B	580	416	740	<DL	<DL	3.86	<DL
126	4C	1040	747	926	<DL	<DL	8.93	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
126	4D	1130	876	979	<DL	<DL	6.69	<DL
126	4E	1910	2150	447	<DL	<DL	15	<DL
126	4F	1960	2040	698	<DL	<DL	11.9	<DL
126	5A	<DL	436	87.7	<DL	<DL	2.75	0.688
126	5B	522	413	638	<DL	<DL	4.5	<DL
126	5C	1070	665	761	<DL	<DL	8.01	<DL
126	5D	790	741	835	<DL	<DL	5.15	<DL
126	5E	1400	1540	356	<DL	<DL	11.5	<DL
126	5F	1200	1670	440	<DL	<DL	11.5	<DL
126	6A	220	446	145	12.8	2.7	3.53	<DL
126	6B	460	376	650	<DL	<DL	3.48	<DL
126	6C	800	609	773	<DL	<DL	7.03	<DL
126	6D	983	640	502	<DL	<DL	6.16	<DL
126	6E	1010	1480	294	<DL	<DL	10.7	<DL
126	6F	1300	1360	405	<DL	<DL	10.9	<DL
126	BCAL	<DL	105	0.45	<DL	<DL	<DL	<DL
126	BDOL	<DL	50	<DL	<DL	<DL	<DL	<DL
126	R2	<DL	24.8	<DL	<DL	<DL	<DL	<DL
130	1A	765	670	1110	290	13.2	4.57	<DL
130	1B	839	595	863	13.7	4.05	5.65	<DL
130	1C	997	788	862	23.7	<DL	9.58	<DL
130	1D	914	743	919	<DL	<DL	4.75	<DL
130	1E	1980	2050	614	<DL	<DL	15.4	<DL
130	1F	794	1500	365	<DL	<DL	9.96	<DL
130	2A	314	339	507	22.2	7.92	2.49	<DL
130	2B	1120	800	1020	15.8	7.93	5.91	<DL
130	2C	1130	727	809	<DL	<DL	6.07	<DL
130	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
130	2E	2410	1810	504	<DL	<DL	14.7	<DL
130	2F	1160	1720	392	<DL	<DL	15.3	<DL
130	3A	156	267	231	<DL	4.2	1.53	<DL
130	3B	377	344	418	<DL	2.01	3.5	<DL
130	3C	1000	521	727	<DL	<DL	7.79	<DL
130	3D	925	887	676	<DL	<DL	6.4	<DL
130	3E	795	1910	307	<DL	<DL	26.2	<DL
130	3F	778	1090	325	<DL	<DL	11.9	<DL
130	4A	256	361	373	<DL	4.9	1.8	<DL
130	4B	605	465	802	<DL	<DL	3.82	<DL
130	4C	990	735	900	<DL	<DL	8.62	<DL
130	4D	1090	898	961	<DL	<DL	6.46	<DL
130	4E	1860	2030	445	<DL	<DL	14.1	<DL
130	4F	717	807	256	<DL	<DL	4.99	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
130	5A	2.8	949	70.3	35.9	<DL	1.74	0.852
130	5B	527	418	651	6	<DL	4.12	<DL
130	5C	1050	667	759	<DL	<DL	8.08	<DL
130	5D	787	684	827	<DL	<DL	5.22	<DL
130	5E	1350	1490	336	<DL	<DL	10.7	<DL
130	5F	964	1430	341	<DL	<DL	10	<DL
130	6A	160	330	104	<DL	2.92	2.32	<DL
130	6B	469	393	651	<DL	<DL	3.17	<DL
130	6C	762	639	742	<DL	<DL	6.36	<DL
130	6D	919	645	474	<DL	<DL	5.37	<DL
130	6E	1010	1520	291	<DL	<DL	10.7	<DL
130	6F	953	1190	290	<DL	<DL	8.96	<DL
130	BCAL	<DL	65.1	<DL	<DL	<DL	<DL	<DL
130	BDOL	0.947	75.7	<DL	<DL	<DL	<DL	<DL
130	R3	<DL	67.3	<DL	<DL	<DL	<DL	<DL
133	1A	776	512	1110	2.58	16.2	3.28	<DL
133	1B	696	542	725	4.25	3.7	5.21	<DL
133	1C	989	763	843	<DL	<DL	9.77	<DL
133	1D	1240	975	1090	<DL	<DL	5.48	<DL
133	1E	1840	1930	557	<DL	<DL	14.9	<DL
133	1F	1170	2030	479	<DL	<DL	13.9	<DL
133	2A	235	303	379	12.8	6.65	2.31	<DL
133	2B	733	559	793	<DL	6.31	4.07	<DL
133	2C	1150	706	823	<DL	<DL	6.29	<DL
133	2D	1340	1160	1260	<DL	3.13	6.03	<DL
133	2E	2440	1800	506	<DL	<DL	15	<DL
133	2F	1130	1630	375	<DL	<DL	14.8	<DL
133	3A	135	249	171	15.1	3.52	1.94	<DL
133	3B	373	349	400	3.14	<DL	3.66	<DL
133	3C	952	488	684	<DL	<DL	7.52	<DL
133	3D	914	755	711	2.32	<DL	6.36	<DL
133	3E	797	1930	289	4.55	<DL	27.1	<DL
133	3F	1270	1660	488	<DL	<DL	17.8	<DL
133	4A	267	390	380	<DL	5.79	2.7	<DL
133	4B	507	393	638	<DL	<DL	3.81	<DL
133	4C	916	711	863	<DL	<DL	9.24	<DL
133	4D	1050	890	918	<DL	<DL	6.58	<DL
133	4E	1870	2140	434	<DL	<DL	14.6	<DL
133	4F	1870	1910	642	<DL	<DL	11.5	<DL
133	5A	<DL	670	82.4	<DL	<DL	2.64	0.836
133	5B	448	377	540	<DL	<DL	3.79	<DL
133	5C	948	656	694	<DL	<DL	7.6	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
133	5D	773	719	811	<DL	<DL	5.13	<DL
133	5E	1320	1480	314	<DL	<DL	11	<DL
133	5F	1100	1540	376	<DL	<DL	10.8	<DL
133	6A	173	419	117	3.5	4.24	2.67	<DL
133	6B	417	367	569	<DL	<DL	2.77	<DL
133	6C	689	553	655	<DL	2.11	6.03	<DL
133	6D	902	726	455	<DL	<DL	5.39	<DL
133	6E	971	1480	265	<DL	<DL	10.5	<DL
133	6F	1230	1360	347	<DL	<DL	10.3	<DL
133	BCAL	<DL	96.5	0.495	<DL	<DL	<DL	<DL
133	BDOL	<DL	126	0.722	<DL	<DL	<DL	<DL
133	R4	<DL	41.7	0.552	<DL	<DL	<DL	<DL
138	1A	948	663	1290	142	18	3.72	<DL
138	1B	781	613	808	34.4	3.77	5.69	<DL
138	1C	1000	801	846	<DL	<DL	8.91	<DL
138	1D	1210	1010	1070	3.99	<DL	5.55	<DL
138	1E	1940	1960	588	14.5	<DL	14.4	<DL
138	1F	1220	2030	479	2.65	<DL	12.6	<DL
138	2A	266	379	420	7.04	5.93	2.47	<DL
138	2B	519	433	580	25	3.78	3.4	<DL
138	2C	1110	672	837	<DL	<DL	5.62	<DL
138	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
138	2E	2520	1720	527	5.26	<DL	13.6	<DL
138	2F	1190	1670	369	<DL	<DL	13.3	<DL
138	3A	135	265	178	<DL	2.51	1.3	<DL
138	3B	431	357	457	<DL	<DL	3.66	<DL
138	3C	1010	506	705	<DL	<DL	6.62	<DL
138	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
138	3E	898	1960	312	<DL	<DL	26.7	<DL
138	3F	1490	1770	550	<DL	<DL	18	<DL
138	4A	286	349	409	<DL	5.56	2.1	<DL
138	4B	547	469	701	<DL	<DL	3.98	<DL
138	4C	985	744	873	<DL	<DL	8.09	<DL
138	4D	922	893	863	<DL	<DL	5.69	<DL
138	4E	1980	2090	455	<DL	<DL	13.9	<DL
138	4F	1840	1830	637	<DL	<DL	10.8	<DL
138	5A	<DL	204	44.1	<DL	<DL	<DL	0.539
138	5B	503	422	597	<DL	<DL	3.28	<DL
138	5C	938	669	683	<DL	<DL	6.96	<DL
138	5D	759	727	800	<DL	<DL	4.69	<DL
138	5E	1290	1410	303	<DL	<DL	9.65	<DL
138	5F	1140	1500	367	<DL	<DL	9.95	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
138	6A	176	529	107	<DL	2.83	2.25	<DL
138	6B	498	411	676	<DL	<DL	2.9	<DL
138	6C	710	582	664	<DL	<DL	5.67	<DL
138	6D	881	665	447	<DL	<DL	4.57	<DL
138	6E	965	1430	258	<DL	<DL	9.85	<DL
138	6F	1220	1330	333	<DL	<DL	9.38	<DL
138	BCAL	<DL	74.3	0.899	<DL	<DL	<DL	<DL
138	BDOL	<DL	101	0.466	<DL	<DL	<DL	<DL
138	R5	<DL	40.9	<DL	<DL	<DL	<DL	<DL
140	1A	901	683	1320	<DL	24.4	3.37	<DL
140	1B	663	523	707	<DL	5.64	4.83	<DL
140	1C	973	1010	880	<DL	2.32	8.51	<DL
140	1D	1160	960	1040	<DL	2.48	4.75	<DL
140	1E	1830	1890	554	<DL	2.26	13.7	<DL
140	1F	1200	2010	435	<DL	3.19	13.2	<DL
140	2A	207	287	344	<DL	8.36	1.94	<DL
140	2B	433	374	493	<DL	5.5	2.87	<DL
140	2C	979	627	792	<DL	<DL	5.39	<DL
140	2D	1380	1070	1140	<DL	2.73	5.87	<DL
140	2E	2550	1700	562	<DL	<DL	14.1	<DL
140	2F	1160	1550	403	<DL	<DL	13.9	<DL
140	3A	130	264	184	<DL	3.37	1.22	<DL
140	3B	335	265	365	<DL	<DL	3.26	<DL
140	3C	935	444	700	<DL	<DL	6.92	<DL
140	3D	900	572	750	<DL	<DL	5.05	<DL
140	3E	937	2020	300	<DL	<DL	29.7	<DL
140	3F	1470	1720	522	<DL	<DL	19.5	<DL
140	4A	182	254	269	<DL	3.72	1.54	<DL
140	4B	483	455	637	<DL	<DL	4.01	<DL
140	4C	905	731	864	<DL	<DL	7.92	<DL
140	4D	912	786	892	<DL	<DL	5.63	<DL
140	4E	1850	1940	434	<DL	<DL	13.2	<DL
140	4F	1870	1750	683	<DL	<DL	11	<DL
140	5A	2.09	340	44.2	<DL	<DL	<DL	<DL
140	5B	365	358	468	<DL	<DL	2.8	<DL
140	5C	875	628	697	<DL	<DL	6.64	<DL
140	5D	724	700	821	<DL	<DL	4.51	<DL
140	5E	1250	1350	301	<DL	<DL	9.68	<DL
140	5F	1150	1520	380	<DL	<DL	10.7	<DL
140	6A	177	365	100	2.22	2.26	2.17	<DL
140	6B	470	541	660	<DL	<DL	2.76	<DL
140	6C	720	607	713	<DL	<DL	5.84	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
140	6D	924	628	510	<DL	<DL	4.93	<DL
140	6E	989	1530	270	<DL	<DL	10.2	<DL
140	6F	1230	1320	340	<DL	<DL	9.88	<DL
140	BCAL	<DL	82.5	<DL	<DL	<DL	<DL	<DL
140	BDOL	<DL	57.4	<DL	<DL	<DL	<DL	<DL
140	R6	<DL	22.6	<DL	<DL	54.7	<DL	<DL
144	1A	1070	1030	1380	<DL	18.6	2.85	<DL
144	1B	710	586	787	137	3.03	5.43	<DL
144	1C	1120	885	934	3.32	<DL	9.78	<DL
144	1D	1240	955	1080	<DL	<DL	5.23	<DL
144	1E	1990	1960	635	<DL	<DL	14.1	<DL
144	1F	1270	2010	454	<DL	<DL	13.2	<DL
144	2A	215	425	372	<DL	5.48	2.19	<DL
144	2B	468	426	555	14.4	2.86	3.22	<DL
144	2C	998	649	816	<DL	<DL	5.55	<DL
144	2D	1210	1980	1210	<DL	<DL	5.17	<DL
144	2E	2670	1810	622	<DL	<DL	14.6	<DL
144	2F	1130	1550	364	<DL	<DL	12.8	<DL
144	3A	143	433	202	<DL	2.71	1.73	<DL
144	3B	379	310	434	<DL	<DL	3.28	<DL
144	3C	969	467	725	<DL	<DL	6.17	<DL
144	3D	722	737	608	<DL	<DL	4.58	<DL
144	3E	1170	1950	327	<DL	<DL	29.1	<DL
144	3F	1650	1750	548	<DL	<DL	18.3	<DL
144	4A	320	655	473	<DL	5.97	2.27	<DL
144	4B	472	368	643	<DL	<DL	3.84	<DL
144	4C	865	633	830	<DL	<DL	7.44	<DL
144	4D	894	874	900	<DL	<DL	5.65	<DL
144	4E	2010	2040	472	<DL	<DL	13.7	<DL
144	4F	1940	1810	718	<DL	<DL	11.1	<DL
144	5A	<DL	275	35.5	<DL	<DL	<DL	0.596
144	5B	363	374	476	<DL	<DL	2.89	<DL
144	5C	844	608	677	<DL	<DL	6.46	<DL
144	5D	735	724	805	<DL	<DL	4.46	<DL
144	5E	1300	1420	316	<DL	<DL	9.77	<DL
144	5F	1150	1480	372	<DL	<DL	10	<DL
144	6A	173	333	91.4	<DL	2.06	2.11	<DL
144	6B	437	379	634	<DL	<DL	2.68	<DL
144	6C	708	551	719	<DL	<DL	5.62	<DL
144	6D	914	609	515	<DL	<DL	4.49	<DL
144	6E	957	1380	260	<DL	<DL	9.9	<DL
144	6F	1110	1230	303	<DL	<DL	8.72	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
144	BCAL	<DL	89	<DL	<DL	<DL	<DL	<DL
144	BDOL	<DL	55.2	<DL	<DL	<DL	<DL	<DL
144	R1	<DL	32.4	<DL	<DL	<DL	<DL	<DL
147	1A	1220	1110	1500	12.2	20.2	2.92	<DL
147	1B	927	687	873	48.4	4.1	5.94	<DL
147	1C	1040	908	856	9.16	<DL	9.18	<DL
147	1D	1500	1290	1250	16	<DL	6.01	<DL
147	1E	2050	2030	621	8	<DL	14.2	<DL
147	1F	1460	2140	463	3.52	<DL	14.4	<DL
147	2A	203	380	352	7.97	5.68	2.12	<DL
147	2B	405	474	474	10.6	2.98	3.09	<DL
147	2C	932	688	745	3.02	<DL	5.63	<DL
147	2D	1340	1470	1370	11.7	<DL	6.26	<DL
147	2E	2710	1810	638	8.33	<DL	13.7	<DL
147	2F	1300	1980	406	10.8	<DL	14.1	<DL
147	3A	135	446	194	15.7	2.9	1.53	<DL
147	3B	338	363	380	7.18	<DL	3.05	<DL
147	3C	850	506	631	7.37	<DL	5.69	<DL
147	3D	797	717	670	6.23	<DL	4.7	0.522
147	3E	1300	1990	305	6.58	<DL	28.2	<DL
147	3F	1890	2010	579	11.2	<DL	20.8	<DL
147	4A	329	434	480	3.79	6.65	2	<DL
147	4B	444	458	603	2	<DL	3.87	<DL
147	4C	835	725	842	<DL	<DL	7.12	<DL
147	4D	868	901	847	<DL	<DL	5.57	<DL
147	4E	2080	2160	474	2.49	<DL	13.9	<DL
147	4F	2030	1870	725	<DL	<DL	11.3	<DL
147	5A	<DL	393	43.4	4.97	<DL	<DL	<DL
147	5B	319	372	418	<DL	<DL	3	<DL
147	5C	795	620	645	<DL	<DL	6.54	<DL
147	5D	694	745	767	<DL	<DL	4.28	<DL
147	5E	1270	1400	301	<DL	<DL	9.7	<DL
147	5F	1190	1580	367	<DL	<DL	11	<DL
147	6A	166	494	98.9	6.1	3.08	2.37	<DL
147	6B	395	411	572	<DL	<DL	2.62	<DL
147	6C	713	652	712	<DL	<DL	5.8	<DL
147	6D	894	681	495	<DL	<DL	4.61	<DL
147	6E	951	1490	247	<DL	<DL	10	<DL
147	6F	1130	1320	292	<DL	<DL	9.25	<DL
147	BCAL	<DL	87.2	<DL	<DL	<DL	<DL	<DL
147	BDOL	<DL	160	0.484	<DL	<DL	<DL	<DL
147	R2	<DL	121	<DL	<DL	<DL	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
		Element, Unit, Detection Limit						
151	1A	1290	1090	1620	20.7	22.7	5.27	<DL
151	1B	996	762	905	21.3	4.06	5.46	<DL
151	1C	1090	864	851	2.43	<DL	8.54	<DL
151	1D	1270	1020	1000	5.33	<DL	5.19	<DL
151	1E	2320	2270	715	34.6	<DL	14.9	<DL
151	1F	1430	2060	423	7.18	17.3	13.5	<DL
151	2A	177	403	308	13.3	4.69	2.15	<DL
151	2B	374	410	445	21.6	2.62	2.92	<DL
151	2C	893	676	706	8.98	<DL	5.08	<DL
151	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
151	2E	1970	1920	607	14.1	5.51	12.6	<DL
151	2F	1220	1630	401	<DL	<DL	12.1	<DL
151	3A	159	558	247	6.03	3.97	2.35	<DL
151	3B	383	465	432	6.05	<DL	3.58	<DL
151	3C	828	499	607	<DL	<DL	5.15	<DL
151	3D	754	774	664	<DL	<DL	4.61	<DL
151	3E	1490	1930	306	3.71	<DL	26.5	<DL
151	3F	1660	1750	481	<DL	<DL	17.3	<DL
151	4A	154	311	224	<DL	2.7	1.54	<DL
151	4B	461	449	619	<DL	<DL	4.06	<DL
151	4C	980	893	937	5.77	<DL	7.96	<DL
151	4D	820	943	832	<DL	<DL	5.35	<DL
151	4E	1990	2030	444	<DL	<DL	13	<DL
151	4F	1910	1820	686	<DL	<DL	10.9	<DL
151	5A	5.69	434	39.7	<DL	<DL	1.34	<DL
151	5B	320	412	414	3.98	<DL	3.18	<DL
151	5C	720	606	583	<DL	<DL	6.04	<DL
151	5D	663	745	729	<DL	<DL	4.21	<DL
151	5E	1260	1350	294	<DL	<DL	8.74	<DL
151	5F	1160	1510	349	<DL	<DL	10	<DL
151	6A	218	512	100	13.8	3.17	3.21	<DL
151	6B	369	409	528	<DL	<DL	2.57	<DL
151	6C	652	609	651	<DL	<DL	5.18	<DL
151	6D	826	648	478	<DL	<DL	4.24	<DL
151	6E	944	1440	240	<DL	<DL	9.63	<DL
151	6F	1090	1300	283	<DL	<DL	8.83	<DL
151	BCAL	<DL	154	<DL	<DL	<DL	<DL	<DL
151	BDOL	<DL	154	<DL	<DL	<DL	<DL	<DL
151	R3	<DL	101	2.36	<DL	<DL	<DL	<DL
154	1A	718	736	921	106	14.7	3.4	<DL
154	1B	876	632	853	49.2	3.87	5.31	<DL
154	1C	1230	841	907	11.9	<DL	9.81	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Mn	Na	Ni	P	Pb	Rb	Sb
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
		0.2	2	0.4	2	2	1	0.4
154	1D	1320	1010	1020	7.17	<DL	5.35	<DL
154	1E	2090	1950	652	13.1	<DL	13.2	<DL
154	1F	1380	1750	396	6.36	<DL	13.2	<DL
154	2A	218	408	387	25.9	6.02	2.25	<DL
154	2B	411	380	490	21.2	2.83	2.91	<DL
154	2C	844	575	676	5.96	<DL	4.78	<DL
154	2D	1040	901	1130	5.02	2.55	5.03	<DL
154	2E	2950	1750	720	4.85	<DL	14.5	<DL
154	2F	1010	1230	290	<DL	<DL	11.4	<DL
154	3A	173	356	231	18.3	3.85	1.9	<DL
154	3B	335	306	390	4.49	<DL	2.76	<DL
154	3C	830	400	621	<DL	<DL	4.94	<DL
154	3D	725	782	653	<DL	<DL	4.25	<DL
154	3E	1720	1750	320	4.82	<DL	25.5	<DL
154	3F	1280	1190	351	<DL	<DL	14.3	<DL
154	4A	204	217	265	3.39	3.12	1.57	<DL
154	4B	447	350	617	<DL	<DL	3.94	<DL
154	4C	819	621	790	<DL	<DL	6.59	<DL
154	4D	827	774	811	<DL	<DL	5.28	<DL
154	4E	2210	1900	495	5.46	<DL	13.2	<DL
154	4F	1180	986	437	<DL	<DL	7.2	<DL
154	5A	4.34	367	45.4	19.8	<DL	1.02	<DL
154	5B	282	299	374	9.99	<DL	2.95	<DL
154	5C	708	533	571	3.66	<DL	5.88	<DL
154	5D	645	651	705	<DL	<DL	4.16	<DL
154	5E	1270	1260	297	<DL	<DL	9.22	<DL
154	5F	1170	1330	344	<DL	<DL	10.4	<DL
154	6A	217	394	89.6	6.4	2.66	2.67	<DL
154	6B	372	375	538	6.31	<DL	2.65	<DL
154	6C	640	521	644	<DL	<DL	5.19	<DL
154	6D	841	583	500	<DL	<DL	4.38	<DL
154	6E	942	1290	232	<DL	<DL	9.68	<DL
154	6F	988	1100	248	<DL	2.43	8.42	<DL
154	BCAL	<DL	116	0.937	<DL	<DL	<DL	<DL
154	BDOL	<DL	73.9	0.407	<DL	<DL	<DL	<DL
154	R4	<DL	32	<DL	<DL	<DL	<DL	<DL
172	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	1B	759	1185	771	315	6.39	13.26	n.d.
172	1C	1350	1050	839	44.4	<DL	13.9	<DL
172	1D	1460	1240	1060	7.53	<DL	8.97	<DL
172	1E	2220	1870	658	<DL	<DL	13.7	<DL
172	1F	1550	1240	337	<DL	<DL	5.9	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Mn µg/L 0.2	Na µg/L 2	Ni µg/L 0.4	P µg/L 2	Pb µg/L 2	Rb µg/L 1	Sb µg/L 0.4
172	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2E	2710	1600	689	<DL	<DL	13.6	<DL
172	2F	1440	1100	241	<DL	<DL	5.92	<DL
172	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	3B	590	540	663	44	2.56	7.47	<DL
172	3C	1310	663	774	<DL	<DL	5.95	<DL
172	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	3E	1980	1890	387	n.d.	n.d.	21	n.d.
172	3F	1450	952	311	<DL	<DL	6	<DL
172	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	4B	717	589	743	3.34	<DL	9.74	<DL
172	4C	943	771	745	<DL	<DL	9.44	<DL
172	4D	940.5	892.5	804	n.d.	n.d.	8.175	n.d.
172	4E	2340	1870	513	<DL	<DL	12.8	<DL
172	4F	1740	1140	502	<DL	<DL	5.47	<DL
172	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	5B	297.5	5355	211.75	302.75	n.d.	9.6075	n.d.
172	5C	776	651	623	<DL	<DL	8.38	<DL
172	5D	702	778	660	<DL	<DL	5.67	<DL
172	5E	1260	1200	325	<DL	<DL	8.49	<DL
172	5F	1060	858	290	<DL	<DL	4.96	<DL
172	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	BCAL	<DL	404	6.33	<DL	<DL	1.2	<DL
172	BDOL	4.87	201	2.36	<DL	<DL	<DL	<DL

Table 13: cont

		Element, Unit, Detection Limit						
Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
0	1A	1.39	7.16	3850	<DL	6.2	<DL	<DL
0	1B	3.38	4.86	9040	<DL	15.3	<DL	<DL
0	1C	2.79	2.46	7790	<DL	16.3	<DL	<DL
0	1D	3.09	2.18	8570	<DL	19.4	<DL	<DL
0	1E	4.64	1.86	11900	<DL	37	<DL	<DL
0	1F	4.98	1.75	12500	<DL	44.4	<DL	<DL
0	2A	1.02	5.53	2680	<DL	3.89	<DL	<DL
0	2B	4.27	4.43	10900	<DL	10.5	<DL	<DL
0	2C	2.86	1.83	7930	<DL	19	<DL	<DL
0	2D	3.62	2.33	9880	<DL	28.3	<DL	<DL
0	2E	4.59	1.32	11800	<DL	24.4	<DL	<DL
0	2F	5.05	1.06	12200	<DL	23.6	<DL	<DL
0	3A	1.48	6.1	3900	<DL	5.39	<DL	<DL
0	3B	2.92	3.02	7770	<DL	10.4	<DL	<DL
0	3C	2.53	1.53	7200	<DL	18.6	<DL	<DL
0	3D	4.58	2.35	12000	<DL	31.9	<DL	<DL
0	3E	4.63	1.68	12100	<DL	24.7	<DL	<DL
0	3F	5.16	1.58	12600	<DL	26.1	<DL	<DL
0	4A	<DL	1.99	535	<DL	<DL	<DL	<DL
0	4B	2.53	1.99	7120	<DL	11	<DL	<DL
0	4C	2.4	1.52	6990	<DL	20	<DL	<DL
0	4D	2.77	1.26	7890	<DL	22.9	<DL	<DL
0	4E	4.77	1.46	12400	<DL	26	<DL	<DL
0	4F	5.13	1.71	12800	<DL	32.2	<DL	<DL
0	5A	<DL	2.59	933	<DL	1.63	<DL	<DL
0	5B	2.72	2.9	7390	<DL	9.22	<DL	<DL
0	5C	2.34	2.1	6700	<DL	19.2	<DL	<DL
0	5D	2.69	1.34	7680	<DL	24.3	<DL	<DL
0	5E	4.75	1.65	11900	<DL	25.9	<DL	<DL
0	5F	5.23	1.92	12800	<DL	33.4	<DL	<DL
0	6A	1.42	4.77	2920	<DL	4.1	<DL	<DL
0	6B	2.67	3.03	7400	<DL	9.63	<DL	<DL
0	6C	2.47	2.57	7170	<DL	20	<DL	<DL
0	6D	2.94	2.19	8270	<DL	31.4	<DL	<DL
0	6E	4.74	2.6	12400	<DL	28.8	<DL	<DL
0	6F	5.02	1.87	12600	<DL	35.7	<DL	<DL
0	BCAL	<DL	1.54	<DL	<DL	<DL	<DL	<DL
0	BDOL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
0	R1	<DL	1.79	<DL	<DL	<DL	<DL	<DL
4	1A	2.59	14.1	6550	<DL	8.62	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
4	1B	3.43	4.53	9010	<DL	11.3	<DL	<DL
4	1C	2.8	2.03	7880	<DL	16.3	<DL	<DL
4	1D	3.26	2.19	9120	<DL	18.3	<DL	<DL
4	1E	4.63	1.7	12300	<DL	30	<DL	<DL
4	1F	4.98	1.83	12800	<DL	36.9	<DL	<DL
4	2A	1.8	7	4730	<DL	9.97	<DL	<DL
4	2B	4.45	4.56	11700	<DL	19.9	<DL	<DL
4	2C	2.92	1.73	8090	<DL	18.8	<DL	<DL
4	2D	2.94	1.59	8210	<DL	18	<DL	<DL
4	2E	4.36	1.52	11800	<DL	23.9	<DL	<DL
4	2F	4.88	1.87	12400	<DL	23.6	<DL	<DL
4	3A	1.41	6.13	3500	<DL	7.92	<DL	<DL
4	3B	3.28	2.64	8780	<DL	11.9	<DL	<DL
4	3C	2.68	1.48	7370	<DL	18.7	<DL	<DL
4	3D	3.3	1.96	8760	<DL	20.6	<DL	<DL
4	3E	4.52	1.45	12000	<DL	29.3	<DL	<DL
4	3F	4.99	1.47	12400	<DL	23.9	<DL	<DL
4	4A	<DL	2.65	1540	<DL	8.45	<DL	<DL
4	4B	2.82	1.87	7700	<DL	10.9	<DL	<DL
4	4C	2.48	1.78	7050	<DL	21	<DL	<DL
4	4D	2.86	1.92	8050	<DL	21.6	<DL	<DL
4	4E	4.63	2.09	11900	<DL	26.4	<DL	<DL
4	4F	5.07	2.48	12800	<DL	24.6	<DL	<DL
4	5A	1.76	6.23	4470	<DL	42.9	<DL	<DL
4	5B	2.98	2.75	8190	<DL	13.5	<DL	<DL
4	5C	2.38	2.23	6730	<DL	19	<DL	<DL
4	5D	2.59	1.85	7330	<DL	21.5	<DL	<DL
4	5E	4.44	1.25	11600	<DL	26	<DL	<DL
4	5F	5.1	1.9	12500	<DL	25.3	<DL	<DL
4	6A	1.06	4.09	2460	<DL	10.2	<DL	<DL
4	6B	3.15	2.28	8360	<DL	11.9	<DL	<DL
4	6C	2.58	1.98	7140	<DL	20.3	<DL	<DL
4	6D	2.8	1.97	7800	<DL	23.8	<DL	<DL
4	6E	4.48	1.03	11800	<DL	28.9	<DL	<DL
4	6F	5.07	1.83	12600	<DL	26.2	<DL	<DL
4	BCAL	<DL	1.6	383	<DL	33.2	<DL	<DL
4	BDOL	<DL	1.35	9.56	<DL	262	<DL	<DL
4	R3	<DL	1.05	<DL	<DL	<DL	<DL	<DL
7	1A	1.2	4.82	3160	<DL	4.05	<DL	<DL
7	1B	3.51	3.26	8920	<DL	11.2	<DL	<DL
7	1C	2.78	<DL	7670	<DL	16	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
7	1D	2.97	<DL	8300	<DL	19	<DL	<DL
7	1E	4.4	<DL	11600	<DL	28.4	<DL	<DL
7	1F	4.67	<DL	11800	<DL	30	<DL	<DL
7	2A	1.34	2.97	3790	<DL	6.22	<DL	<DL
7	2B	4.42	2.44	11400	<DL	19.4	<DL	<DL
7	2C	2.98	<DL	8110	<DL	20.1	<DL	<DL
7	2D	2.85	<DL	7710	<DL	18.9	<DL	<DL
7	2E	4.26	<DL	11200	<DL	23.6	<DL	<DL
7	2F	5.5	<DL	13200	<DL	27	<DL	<DL
7	3A	1.49	6.8	3630	<DL	10.4	<DL	<DL
7	3B	3.29	1.68	8800	<DL	16	<DL	<DL
7	3C	2.58	<DL	7110	<DL	16.3	<DL	<DL
7	3D	3.26	<DL	9000	<DL	25.5	<DL	<DL
7	3E	4.58	<DL	11800	4.14	27.7	<DL	<DL
7	3F	4.71	<DL	11600	<DL	22.4	<DL	<DL
7	4A	<DL	<DL	912	<DL	5.09	<DL	<DL
7	4B	2.78	<DL	7620	<DL	10.4	<DL	<DL
7	4C	2.39	<DL	6890	<DL	19.6	<DL	<DL
7	4D	2.67	<DL	7480	<DL	22	<DL	<DL
7	4E	4.41	<DL	11600	<DL	25.6	<DL	<DL
7	4F	4.81	<DL	11900	<DL	24.2	<DL	<DL
7	5A	1.26	3.4	3380	<DL	24.7	<DL	<DL
7	5B	2.85	1.53	7450	<DL	12.2	<DL	<DL
7	5C	2.31	<DL	6510	<DL	19.5	<DL	<DL
7	5D	2.49	<DL	7120	<DL	22.8	<DL	<DL
7	5E	4.31	<DL	11300	<DL	26.1	<DL	<DL
7	5F	4.88	<DL	11700	<DL	22.8	<DL	<DL
7	6A	<DL	1.84	675	<DL	4.96	<DL	<DL
7	6B	3.42	1.02	9130	<DL	12.8	<DL	<DL
7	6C	2.5	<DL	7090	<DL	20.5	<DL	<DL
7	6D	2.51	<DL	6940	<DL	20.9	<DL	<DL
7	6E	4.52	<DL	11800	<DL	26.7	<DL	<DL
7	6F	4.9	<DL	12200	<DL	24	<DL	<DL
7	BCAL	<DL	<DL	304	<DL	26.4	<DL	<DL
7	BDOL	<DL	<DL	56.2	<DL	536	<DL	<DL
7	R4	<DL	<DL	<DL	<DL	<DL	<DL	<DL
11	1A	1.3	6.01	3250	<DL	4.5	<DL	<DL
11	1B	3.8	3.47	9560	<DL	11.7	<DL	<DL
11	1C	2.92	<DL	7880	<DL	14.8	<DL	<DL
11	1D	3.27	<DL	8540	<DL	17.9	<DL	<DL
11	1E	4.65	<DL	11800	<DL	27.5	<DL	<DL
11	1F	4.92	<DL	12100	<DL	27.9	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
11	2A	1.98	5.95	5180	<DL	6.57	<DL	<DL
11	2B	3.87	4.27	9500	<DL	13.5	<DL	<DL
11	2C	3.1	<DL	8290	<DL	20.3	<DL	<DL
11	2D	3.45	<DL	9090	<DL	22.5	<DL	<DL
11	2E	4.4	<DL	11500	<DL	22.9	<DL	<DL
11	2F	4.83	<DL	12100	<DL	24.1	<DL	<DL
11	3A	2.55	9.41	6330	<DL	13.3	<DL	<DL
11	3B	3.53	1.07	8930	<DL	14.4	<DL	<DL
11	3C	2.67	<DL	7220	<DL	15.5	<DL	<DL
11	3D	3.82	<DL	10200	<DL	28.4	<DL	<DL
11	3E	4.57	<DL	11900	<DL	25.6	<DL	<DL
11	3F	4.81	<DL	12000	<DL	24.5	<DL	<DL
11	4A	<DL	<DL	1360	<DL	6.56	<DL	<DL
11	4B	2.88	<DL	7670	<DL	10.3	<DL	<DL
11	4C	2.49	<DL	6930	<DL	18	<DL	<DL
11	4D	2.92	<DL	8130	<DL	23.5	<DL	<DL
11	4E	4.43	<DL	11600	<DL	24.2	<DL	<DL
11	4F	4.72	<DL	11400	<DL	22.1	<DL	<DL
11	5A	2.49	5.65	6260	<DL	37.7	<DL	<DL
11	5B	3.27	1.69	8370	<DL	11.2	<DL	<DL
11	5C	2.3	<DL	6530	<DL	16	<DL	<DL
11	5D	2.63	<DL	7180	<DL	21.3	<DL	<DL
11	5E	4.36	<DL	11400	<DL	24.9	<DL	<DL
11	5F	4.87	<DL	12100	<DL	23	<DL	<DL
11	6A	1.07	3.35	2400	<DL	4.85	<DL	<DL
11	6B	3.58	1.07	9670	<DL	12.4	<DL	<DL
11	6C	2.58	<DL	7190	<DL	20	<DL	<DL
11	6D	2.71	<DL	7540	<DL	20.9	<DL	<DL
11	6E	4.49	<DL	11800	<DL	26	<DL	<DL
11	6F	4.83	<DL	12100	<DL	23.9	<DL	<DL
11	BCAL	<DL	<DL	230	<DL	20.3	<DL	<DL
11	BDOL	<DL	<DL	51.6	<DL	256	<DL	<DL
11	R5	<DL	<DL	<DL	<DL	<DL	<DL	<DL
14	1A	<DL	5.53	2020	<DL	3.52	<DL	<DL
14	1B	3.95	6.26	9400	<DL	13	<DL	<DL
14	1C	2.78	1.92	7590	<DL	14.8	<DL	<DL
14	1D	2.52	1.38	6830	<DL	14.6	<DL	<DL
14	1E	4.37	<DL	11500	<DL	25.6	<DL	<DL
14	1F	4.66	1.14	11600	<DL	25.8	<DL	<DL
14	2A	2.11	7.14	5710	<DL	6.77	<DL	<DL
14	2B	3.43	6.91	8220	<DL	9.94	<DL	<DL
14	2C	2.92	<DL	8050	<DL	19.6	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
14	2D	2.58	<DL	7200	<DL	17.9	<DL	<DL
14	2E	4.23	1.06	11300	<DL	22.2	<DL	<DL
14	2F	4.39	<DL	11100	<DL	23.9	<DL	<DL
14	3A	2.24	9.07	5800	<DL	14.5	<DL	<DL
14	3B	3.01	2.87	7430	<DL	9.78	<DL	<DL
14	3C	2.53	<DL	7020	<DL	14.7	<DL	<DL
14	3D	2.78	1.15	7780	<DL	21.4	<DL	<DL
14	3E	4.34	<DL	11600	<DL	24.5	<DL	<DL
14	3F	4.49	<DL	11300	<DL	23.4	<DL	<DL
14	4A	<DL	1.6	1060	<DL	3.11	<DL	<DL
14	4B	2.73	1.15	7750	<DL	9.93	<DL	<DL
14	4C	2.28	<DL	6760	<DL	16.8	<DL	<DL
14	4D	2.38	<DL	6990	<DL	19.4	<DL	<DL
14	4E	4.21	<DL	11500	<DL	22.8	<DL	<DL
14	4F	4.27	1.06	11100	<DL	22	<DL	<DL
14	5A	<DL	4.12	2280	<DL	13.3	<DL	<DL
14	5B	3.18	4.33	7970	<DL	9.04	<DL	<DL
14	5C	2.19	1.62	6440	<DL	15.2	<DL	<DL
14	5D	2.3	1.1	6520	<DL	17.7	<DL	<DL
14	5E	4.32	1.14	11400	<DL	25.3	<DL	<DL
14	5F	4.58	1.3	11500	<DL	22.5	<DL	<DL
14	6A	<DL	4.18	2060	<DL	3.92	<DL	<DL
14	6B	3.95	3.11	10000	<DL	12.7	<DL	<DL
14	6C	2.6	1.37	7080	<DL	18.4	<DL	<DL
14	6D	2.72	1.66	7290	<DL	19.6	<DL	<DL
14	6E	4.6	1.67	11700	<DL	25	<DL	<DL
14	6F	4.51	1.21	11300	<DL	22.9	<DL	<DL
14	BCAL	<DL	<DL	220	<DL	19.2	<DL	<DL
14	BDOL	<DL	<DL	34.3	<DL	397	<DL	<DL
14	R6	<DL	<DL	<DL	<DL	<DL	<DL	<DL
18	1A	<DL	3.67	1560	<DL	2.28	<DL	<DL
18	1B	4.68	7.2	10900	<DL	15.4	<DL	<DL
18	1C	2.8	1.38	7610	<DL	13.9	<DL	<DL
18	1D	2.54	1.62	7040	<DL	14.4	<DL	<DL
18	1E	4.31	1.34	11500	<DL	25.3	<DL	<DL
18	1F	4.55	1.08	11400	<DL	23.9	<DL	<DL
18	2A	3.24	10.9	8930	<DL	12.5	<DL	<DL
18	2B	3.49	6.75	8330	<DL	9.09	<DL	<DL
18	2C	2.9	1.32	7910	<DL	18.2	<DL	<DL
18	2D	2.64	1.69	7260	<DL	17.1	<DL	<DL
18	2E	4.16	1.1	11300	<DL	21.8	<DL	<DL
18	2F	4.41	1.25	11400	<DL	24.5	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
18	3A	1.44	6.97	3760	<DL	10.8	<DL	<DL
18	3B	2.85	2.87	7020	<DL	7.45	<DL	<DL
18	3C	2.53	1.17	7200	<DL	14.9	<DL	<DL
18	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
18	3E	4.28	<DL	11900	<DL	23.3	<DL	<DL
18	3F	4.3	<DL	11200	<DL	25.4	<DL	<DL
18	4A	<DL	1.49	708	<DL	1.38	<DL	<DL
18	4B	3.21	1.53	9150	<DL	11.8	<DL	<DL
18	4C	2.29	<DL	6760	<DL	16.2	<DL	<DL
18	4D	2.37	2.17	6460	<DL	15.9	<DL	<DL
18	4E	4.57	1.21	11600	<DL	22.4	<DL	<DL
18	4F	1.16	<DL	2390	<DL	10.7	<DL	<DL
18	5A	<DL	5.04	2300	<DL	18.5	<DL	<DL
18	5B	3.29	4.91	7630	<DL	7.72	<DL	<DL
18	5C	2.36	1.27	6440	<DL	14.6	<DL	<DL
18	5D	<DL	1.02	2740	<DL	9.29	<DL	<DL
18	5E	4.34	1.05	11400	<DL	24.1	<DL	<DL
18	5F	4.56	<DL	11400	<DL	23.1	<DL	<DL
18	6A	<DL	5.65	1390	<DL	10.9	<DL	<DL
18	6B	4.04	3.09	10700	<DL	13.4	<DL	<DL
18	6C	2.47	1.08	7210	<DL	19.6	<DL	<DL
18	6D	<DL	<DL	2880	<DL	10.4	<DL	<DL
18	6E	4.37	<DL	11700	<DL	24.8	<DL	<DL
18	6F	1.31	<DL	2990	<DL	14.8	<DL	<DL
18	BCAL	<DL	<DL	156	<DL	17.2	<DL	<DL
18	BDOL	<DL	<DL	29.5	<DL	363	<DL	<DL
18	R1	<DL	<DL	<DL	<DL	<DL	<DL	<DL
21	1A	<DL	3.15	1230	<DL	2.49	<DL	<DL
21	1B	4	7.18	8960	<DL	13.5	<DL	<DL
21	1C	2.63	<DL	7140	<DL	13.2	<DL	<DL
21	1D	2.26	<DL	6230	<DL	14.1	<DL	<DL
21	1E	4.06	<DL	10700	<DL	23.5	<DL	<DL
21	1F	4.2	1.01	10700	<DL	24.9	<DL	<DL
21	2A	2.15	6.82	6020	<DL	9.38	<DL	<DL
21	2B	3.36	7.8	8250	<DL	9.37	<DL	<DL
21	2C	2.57	<DL	7270	<DL	17.1	<DL	<DL
21	2D	2.22	<DL	6210	<DL	16.8	<DL	<DL
21	2E	3.92	<DL	10700	<DL	21.9	<DL	<DL
21	2F	4.21	<DL	10800	<DL	25.6	<DL	<DL
21	3A	2.72	11.7	6830	<DL	19.1	<DL	<DL
21	3B	2.57	2.97	5990	<DL	6.2	<DL	<DL
21	3C	2.37	1.39	6580	<DL	14.5	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
21	3D	2.76	1.27	7160	<DL	21.1	<DL	<DL
21	3E	4.2	<DL	11000	<DL	23.5	<DL	<DL
21	3F	4.22	<DL	10700	<DL	25.1	<DL	<DL
21	4A	<DL	1.65	1110	<DL	3	<DL	<DL
21	4B	2.95	1.16	8010	<DL	11.3	<DL	<DL
21	4C	2.19	<DL	6180	<DL	16.2	<DL	<DL
21	4D	2.14	<DL	6210	<DL	17.1	<DL	<DL
21	4E	3.84	<DL	10300	<DL	20.7	<DL	<DL
21	4F	4.04	<DL	10400	<DL	21.8	<DL	<DL
21	5A	1.26	5.83	3410	<DL	11.7	<DL	<DL
21	5B	3.49	4.75	8140	<DL	8.38	<DL	<DL
21	5C	2.12	<DL	6030	<DL	13.4	<DL	<DL
21	5D	2.14	<DL	6250	<DL	15.4	<DL	<DL
21	5E	3.82	<DL	10500	<DL	24.4	<DL	<DL
21	5F	4.17	<DL	10800	<DL	24	<DL	<DL
21	6A	1.16	4.19	3070	<DL	4.95	<DL	<DL
21	6B	3.66	2.8	9390	<DL	12.2	<DL	<DL
21	6C	2.32	<DL	6670	<DL	18.7	<DL	<DL
21	6D	2.31	<DL	6690	<DL	16.1	<DL	<DL
21	6E	3.97	<DL	10800	<DL	23.4	<DL	<DL
21	6F	4.11	<DL	10800	<DL	24	<DL	<DL
21	BCAL	<DL	<DL	137	<DL	13.2	<DL	<DL
21	BDOL	<DL	<DL	21.9	<DL	465	<DL	<DL
21	R2	<DL	<DL	<DL	<DL	<DL	<DL	<DL
25	1A	<DL	2.02	1520	<DL	4.63	<DL	<DL
25	1B	3.59	6.58	8320	<DL	14.5	<DL	<DL
25	1C	2.64	<DL	7200	<DL	13	<DL	<DL
25	1D	2.44	<DL	6410	<DL	14.1	<DL	<DL
25	1E	4.05	<DL	10800	<DL	22.5	<DL	<DL
25	1F	4.33	1.05	10900	<DL	24.2	<DL	<DL
25	2A	2.36	5.85	6430	<DL	9.9	<DL	<DL
25	2B	3.49	8.08	8580	<DL	10.5	<DL	<DL
25	2C	2.65	1.14	7210	<DL	14.1	<DL	<DL
25	2D	<DL	<DL	1420	<DL	3.61	<DL	<DL
25	2E	3.91	<DL	10500	<DL	21.2	<DL	<DL
25	2F	4.18	<DL	10800	<DL	24.9	<DL	<DL
25	3A	1.47	4.61	4120	<DL	8.54	<DL	<DL
25	3B	2.49	1.35	6140	<DL	6.98	<DL	<DL
25	3C	2.28	<DL	6500	<DL	13.8	<DL	<DL
25	3D	2.2	<DL	6160	<DL	16	<DL	<DL
25	3E	4.05	<DL	10900	<DL	22.3	<DL	<DL
25	3F	4.08	<DL	10800	<DL	25.9	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
25	4A	<DL	<DL	1420	<DL	4.22	<DL	<DL
25	4B	2.77	1.52	7250	<DL	10.7	<DL	<DL
25	4C	2.23	<DL	6390	<DL	16.5	<DL	<DL
25	4D	2.13	<DL	6250	<DL	18.9	<DL	<DL
25	4E	3.96	<DL	10700	<DL	21.4	<DL	<DL
25	4F	4.16	<DL	10900	<DL	23.5	<DL	<DL
25	5A	1.29	5.02	3700	<DL	11.3	<DL	<DL
25	5B	4.04	4.43	9620	<DL	10.4	<DL	<DL
25	5C	2.19	<DL	6370	<DL	13.6	<DL	<DL
25	5D	2.22	<DL	6380	<DL	14.9	<DL	<DL
25	5E	3.84	<DL	10600	<DL	23.7	<DL	<DL
25	5F	4.11	<DL	10700	<DL	23.9	<DL	<DL
25	6A	1.77	4.63	4140	<DL	8.85	<DL	<DL
25	6B	3.64	2.69	8980	<DL	11.7	<DL	<DL
25	6C	2.35	<DL	6800	<DL	18.1	<DL	<DL
25	6D	2.41	<DL	6800	<DL	13.4	<DL	<DL
25	6E	4.02	<DL	10900	<DL	25.1	<DL	<DL
25	6F	4.06	<DL	10700	<DL	23.1	<DL	<DL
25	BCAL	<DL	<DL	86.1	<DL	9.56	<DL	<DL
25	BDOL	<DL	<DL	24.3	<DL	262	<DL	<DL
25	R3	<DL	<DL	<DL	<DL	<DL	<DL	<DL
28	1A	<DL	2.15	1680	<DL	6.87	<DL	<DL
28	1B	2.53	5.11	7420	<DL	14.3	<DL	<DL
28	1C	1.9	<DL	7420	<DL	12.1	<DL	<DL
28	1D	1.76	<DL	7050	<DL	14.2	<DL	<DL
28	1E	2.95	<DL	11000	<DL	21.3	<DL	<DL
28	1F	3.41	<DL	11800	<DL	23.4	<DL	<DL
28	2A	1.02	3.88	5170	<DL	5.12	<DL	<DL
28	2B	2.34	6.23	8360	<DL	9.92	<DL	<DL
28	2C	1.69	<DL	7420	<DL	11	<DL	<DL
28	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
28	2E	2.79	<DL	11000	<DL	20.1	<DL	<DL
28	2F	3.28	<DL	11800	<DL	24.5	<DL	<DL
28	3A	<DL	3.92	3810	<DL	6	<DL	<DL
28	3B	1.62	1.47	6360	<DL	8.83	<DL	<DL
28	3C	1.42	<DL	6790	<DL	12	<DL	<DL
28	3D	1.66	<DL	7330	<DL	15.8	<DL	<DL
28	3E	3	<DL	11500	<DL	20.7	<DL	<DL
28	3F	3.19	<DL	11700	<DL	24.4	<DL	<DL
28	4A	<DL	<DL	971	<DL	3.36	<DL	<DL
28	4B	1.8	1.6	7140	<DL	9.83	<DL	<DL
28	4C	1.36	<DL	6980	<DL	16.1	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
28	4D	1.33	<DL	6730	<DL	17.7	<DL	<DL
28	4E	2.85	<DL	11400	<DL	18.9	<DL	<DL
28	4F	3.07	<DL	11400	<DL	20.8	<DL	<DL
28	5A	<DL	4.1	2700	<DL	6.19	<DL	<DL
28	5B	3.03	4.48	9960	<DL	9.68	<DL	<DL
28	5C	1.7	1.09	7800	<DL	13.4	<DL	<DL
28	5D	1.27	<DL	6560	<DL	12.4	<DL	<DL
28	5E	2.84	<DL	11100	<DL	21.5	<DL	<DL
28	5F	3.6	1.01	12900	<DL	24.9	<DL	<DL
28	6A	<DL	4.11	3930	<DL	6.53	<DL	<DL
28	6B	2.79	4.03	9050	<DL	12.1	<DL	<DL
28	6C	1.64	1.35	7360	<DL	16.9	<DL	<DL
28	6D	1.51	1.35	7020	<DL	9.51	<DL	<DL
28	6E	3.12	<DL	12000	<DL	20.6	<DL	<DL
28	6F	3.33	1	11900	<DL	20.3	<DL	<DL
28	BCAL	<DL	<DL	181	<DL	11.3	<DL	<DL
28	BDOL	<DL	<DL	19.1	<DL	362	<DL	<DL
28	R4	<DL	<DL	<DL	<DL	<DL	<DL	<DL
32	1A	<DL	2.59	2390	<DL	17.7	<DL	<DL
32	1B	2.08	4.66	7220	<DL	16.7	<DL	<DL
32	1C	1.82	1.19	7820	<DL	13.1	<DL	<DL
32	1D	1.62	1.24	7000	<DL	14.8	<DL	<DL
32	1E	2.94	<DL	11300	<DL	18.3	<DL	<DL
32	1F	3.33	<DL	11700	<DL	21.2	<DL	<DL
32	2A	1.12	3.96	5630	<DL	8.01	<DL	<DL
32	2B	2.38	6.38	8800	<DL	11	<DL	<DL
32	2C	1.76	1.22	7590	<DL	9.66	<DL	<DL
32	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
32	2E	3	1.41	11700	<DL	19.2	<DL	<DL
32	2F	3.24	1.21	12000	<DL	25	<DL	<DL
32	3A	<DL	3.39	3690	<DL	8.67	<DL	<DL
32	3B	1.77	2.14	6690	<DL	13.7	<DL	<DL
32	3C	1.52	1.31	6960	<DL	12.8	<DL	<DL
32	3D	1.66	1.08	7160	<DL	14.6	<DL	<DL
32	3E	3.11	1.58	11700	<DL	20.2	<DL	<DL
32	3F	3.13	1.12	11600	<DL	23.1	<DL	<DL
32	4A	<DL	1.47	1340	<DL	7.03	<DL	<DL
32	4B	1.77	1.88	6970	<DL	10.5	<DL	<DL
32	4C	1.56	1.15	6950	<DL	14.8	<DL	<DL
32	4D	1.55	2.23	6420	<DL	16.3	<DL	<DL
32	4E	3.25	1.93	11700	<DL	18.6	<DL	<DL
32	4F	3.34	1.51	11700	<DL	20.7	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
32	5A	<DL	3.82	2640	<DL	3.65	<DL	<DL
32	5B	3.18	5.22	10200	<DL	11.3	<DL	<DL
32	5C	1.62	1.75	6990	<DL	11.7	<DL	<DL
32	5D	1.68	1.56	7140	<DL	12.6	<DL	<DL
32	5E	3.31	1.77	12000	<DL	22.1	<DL	<DL
32	5F	3.53	1.37	12000	<DL	22.4	<DL	<DL
32	6A	1	2.76	4170	<DL	11.1	<DL	<DL
32	6B	3.12	3.21	10500	<DL	19.7	<DL	<DL
32	6C	1.87	1.53	7560	<DL	16	<DL	<DL
32	6D	1.81	1.69	7430	<DL	9.89	<DL	<DL
32	6E	3.34	1.35	11900	<DL	20.4	<DL	<DL
32	6F	3.5	1.29	12000	<DL	21.8	<DL	<DL
32	BCAL	<DL	1.47	154	<DL	9.07	<DL	<DL
32	BDOL	<DL	1.41	19.3	<DL	274	<DL	<DL
32	R5	<DL	1.53	<DL	<DL	<DL	<DL	<DL
35	1A	<DL	1.38	1830	<DL	20.3	<DL	<DL
35	1B	2.36	3.32	6470	<DL	22.7	<DL	<DL
35	1C	2.2	<DL	7120	<DL	13.8	<DL	<DL
35	1D	2.08	<DL	6620	<DL	16.8	<DL	<DL
35	1E	3.12	<DL	9950	<DL	19.7	<DL	<DL
35	1F	3.58	<DL	11000	<DL	23.7	<DL	<DL
35	2A	1.3	2.15	4200	<DL	7.85	<DL	<DL
35	2B	2.6	4.26	7590	<DL	13.8	<DL	<DL
35	2C	2.13	<DL	6900	<DL	9.27	<DL	<DL
35	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
35	2E	3.33	<DL	10700	<DL	20.1	<DL	<DL
35	2F	3.66	<DL	11200	<DL	27	<DL	<DL
35	3A	<DL	2.49	2430	<DL	9.77	<DL	<DL
35	3B	2.11	1.95	5990	<DL	17.4	<DL	<DL
35	3C	2.06	<DL	6490	<DL	15.1	<DL	<DL
35	3D	2.03	<DL	6290	<DL	16.2	<DL	<DL
35	3E	3.66	1.1	11300	7.83	24	<DL	<DL
35	3F	3.7	<DL	11200	<DL	23.7	<DL	<DL
35	4A	<DL	<DL	831	<DL	6.4	<DL	<DL
35	4B	2.09	1.26	6000	<DL	13.1	<DL	<DL
35	4C	1.98	<DL	6480	<DL	17.2	<DL	<DL
35	4D	1.95	<DL	6440	<DL	19.4	<DL	<DL
35	4E	3.32	<DL	10400	<DL	18.5	<DL	<DL
35	4F	3.71	<DL	11300	<DL	24.2	<DL	<DL
35	5A	<DL	1.96	1950	<DL	3.93	<DL	<DL
35	5B	3.27	3.56	9340	<DL	14.9	<DL	<DL
35	5C	2.03	<DL	6470	<DL	12.6	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
35	5D	2.01	<DL	6510	<DL	13.8	<DL	<DL
35	5E	2.78	<DL	11200	<DL	24.1	<DL	<DL
35	5F	2.95	<DL	11300	<DL	25	<DL	<DL
35	6A	<DL	<DL	2890	<DL	11.3	<DL	<DL
35	6B	2.12	1.95	8460	<DL	23.3	<DL	<DL
35	6C	1.55	<DL	7270	<DL	24.9	<DL	<DL
35	6D	1.49	<DL	7010	<DL	10.8	<DL	<DL
35	6E	2.65	<DL	11500	<DL	23.9	<DL	<DL
35	6F	2.63	<DL	11200	<DL	24	<DL	<DL
35	BCAL	<DL	<DL	129	<DL	8.84	<DL	<DL
35	BDOL	<DL	<DL	22.7	<DL	311	<DL	<DL
35	R6	<DL	<DL	<DL	<DL	<DL	<DL	<DL
39	1A	<DL	1.88	2540	<DL	33.7	<DL	<DL
39	1B	1.78	2.99	7120	<DL	35.6	<DL	<DL
39	1C	1.6	<DL	7390	<DL	16.2	<DL	<DL
39	1D	1.63	<DL	6630	<DL	18.5	<DL	<DL
39	1E	2.62	<DL	10700	<DL	20.6	<DL	<DL
39	1F	2.74	<DL	11100	<DL	24.7	<DL	<DL
39	2A	1.12	2.16	5320	<DL	19.7	<DL	<DL
39	2B	1.91	3.9	7790	<DL	19.8	<DL	<DL
39	2C	1.53	<DL	6870	<DL	8.7	<DL	<DL
39	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
39	2E	2.47	<DL	10600	<DL	20.3	<DL	<DL
39	2F	2.54	<DL	10700	<DL	28.5	<DL	<DL
39	3A	<DL	1.15	2890	<DL	23.6	<DL	<DL
39	3B	1.39	1.03	6100	<DL	22	<DL	<DL
39	3C	1.3	<DL	6370	<DL	16.3	<DL	<DL
39	3D	1.41	<DL	6560	<DL	20.6	<DL	<DL
39	3E	2.52	<DL	10900	1.25	23.8	<DL	<DL
39	3F	2.45	<DL	10900	<DL	25.5	<DL	<DL
39	4A	<DL	<DL	1310	<DL	13.4	<DL	<DL
39	4B	1.37	<DL	6100	<DL	22.2	<DL	<DL
39	4C	1.28	<DL	6420	<DL	21.2	<DL	<DL
39	4D	1.28	<DL	6360	<DL	22.2	<DL	<DL
39	4E	2.28	<DL	10600	<DL	20.4	<DL	<DL
39	4F	2.42	<DL	10700	<DL	23.7	<DL	<DL
39	5A	<DL	<DL	1260	<DL	3.08	<DL	<DL
39	5B	2.28	1.86	9670	<DL	22.2	<DL	<DL
39	5C	1.3	<DL	6530	<DL	14.5	<DL	<DL
39	5D	1.26	<DL	6500	<DL	14.7	<DL	<DL
39	5E	2.28	<DL	10600	<DL	23.2	<DL	<DL
39	5F	2.35	<DL	10500	<DL	24	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
39	6A	<DL	1.11	3110	<DL	21.6	<DL	<DL
39	6B	1.84	1.2	7790	<DL	29.8	<DL	<DL
39	6C	1.4	<DL	6960	<DL	28.4	<DL	<DL
39	6D	1.37	<DL	6870	<DL	11	<DL	<DL
39	6E	2.27	<DL	10300	<DL	21.2	<DL	<DL
39	6F	2.45	<DL	11000	<DL	24.1	<DL	<DL
39	BCAL	<DL	<DL	106	<DL	9.26	<DL	<DL
39	BDOL	<DL	<DL	9.69	<DL	236	<DL	<DL
39	R1	<DL	<DL	<DL	<DL	<DL	<DL	<DL
42	1A	<DL	2.01	1420	<DL	20.1	<DL	<DL
42	1B	1.93	3.72	6120	<DL	41.3	<DL	<DL
42	1C	1.92	1.49	7040	<DL	20.8	<DL	<DL
42	1D	1.75	1.3	6430	<DL	22.4	<DL	<DL
42	1E	2.95	1.15	10700	<DL	22.7	<DL	<DL
42	1F	3.17	1.03	11100	<DL	26.9	<DL	<DL
42	2A	1.01	2.28	4210	<DL	23.4	<DL	<DL
42	2B	2	4.26	7510	<DL	27.4	<DL	<DL
42	2C	1.74	1.38	6930	<DL	10.7	<DL	<DL
42	2D	1.78	1.42	6990	<DL	18.6	<DL	<DL
42	2E	2.84	1.28	10700	<DL	22.1	<DL	<DL
42	2F	3.09	1.31	11100	<DL	30	<DL	<DL
42	3A	<DL	2.43	2740	<DL	28.3	<DL	<DL
42	3B	1.56	1.96	5710	<DL	23.8	<DL	<DL
42	3C	1.51	<DL	6400	<DL	18.9	<DL	<DL
42	3D	1.41	<DL	5840	<DL	20.7	<DL	<DL
42	3E	2.98	1.2	11000	1.29	26.9	<DL	<DL
42	3F	2.99	<DL	11100	<DL	29.1	<DL	<DL
42	4A	<DL	<DL	689	<DL	7.66	<DL	<DL
42	4B	1.54	1.16	5990	<DL	31.8	<DL	<DL
42	4C	1.55	1.32	6570	<DL	26	<DL	<DL
42	4D	1.52	1.11	6540	<DL	26.1	<DL	<DL
42	4E	2.72	1.03	10600	<DL	21.1	<DL	<DL
42	4F	2.86	1.15	10800	<DL	27.4	<DL	<DL
42	5A	<DL	1.31	949	<DL	3.66	<DL	<DL
42	5B	2.54	2.67	9780	<DL	34.3	<DL	<DL
42	5C	1.6	1.05	6730	<DL	16.8	<DL	<DL
42	5D	1.49	<DL	6570	<DL	17.5	<DL	<DL
42	5E	2.71	<DL	10700	<DL	24.8	<DL	<DL
42	5F	2.87	<DL	10900	<DL	27	<DL	<DL
42	6A	<DL	2.8	2040	<DL	14.6	<DL	<DL
42	6B	2.64	3.24	8780	<DL	47.5	<DL	<DL
42	6C	1.86	2.06	7260	<DL	35.5	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
42	6D	1.71	1.29	6520	<DL	13.3	<DL	<DL
42	6E	2.97	1.17	11100	<DL	25	<DL	<DL
42	6F	3.05	1.31	11100	<DL	26.5	<DL	<DL
42	BCAL	<DL	1.15	108	<DL	10.3	<DL	<DL
42	BDOL	<DL	1.27	<DL	<DL	313	<DL	<DL
42	R2	<DL	1.06	<DL	<DL	<DL	<DL	<DL
47	1A	n.d.	4.425	4300	n.d.	71.75	n.d.	n.d.
47	1B	1.84	3.3	6680	<DL	52.7	<DL	<DL
47	1C	1.76	1.65	7020	<DL	21.4	<DL	<DL
47	1D	1.5	1.49	6130	<DL	23.2	<DL	<DL
47	1E	2.72	1.21	10800	<DL	23	<DL	<DL
47	1F	2.9	<DL	10900	<DL	28.8	<DL	<DL
47	2A	1.06	2.39	4820	<DL	52.8	<DL	<DL
47	2B	1.94	3.3	7660	<DL	48.4	<DL	<DL
47	2C	1.65	1.48	6840	<DL	11.6	<DL	<DL
47	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
47	2E	2.69	1.04	10800	<DL	22.7	<DL	<DL
47	2F	2.93	<DL	11100	<DL	31.5	<DL	<DL
47	3A	<DL	1.9	1970	<DL	21.5	<DL	<DL
47	3B	1.53	1.81	6010	<DL	30.3	<DL	<DL
47	3C	1.45	<DL	6310	<DL	20	<DL	<DL
47	3D	1.5	<DL	6510	<DL	23	<DL	<DL
47	3E	2.85	1.04	11000	<DL	30.4	<DL	<DL
47	3F	2.74	<DL	10800	<DL	29.4	<DL	<DL
47	4A	<DL	<DL	809	<DL	9.2	<DL	<DL
47	4B	1.53	<DL	6200	<DL	42.7	<DL	<DL
47	4C	1.43	<DL	6490	<DL	27.5	<DL	<DL
47	4D	1.74	1.86	6550	<DL	28.2	<DL	<DL
47	4E	2.92	1.14	10600	<DL	20.9	<DL	<DL
47	4F	2.99	1	10700	<DL	27.5	<DL	<DL
47	5A	<DL	1.81	1060	<DL	7.13	<DL	<DL
47	5B	2.92	3.05	11100	<DL	61.1	<DL	<DL
47	5C	1.51	1.12	6330	<DL	16.4	<DL	<DL
47	5D	1.58	1.17	6610	<DL	19.9	<DL	<DL
47	5E	2.84	1.17	11200	<DL	24.8	<DL	<DL
47	5F	3.1	1.18	11300	<DL	30.8	<DL	<DL
47	6A	<DL	2.46	2290	<DL	18.5	<DL	<DL
47	6B	2.64	2.64	10000	<DL	64.5	<DL	<DL
47	6C	1.83	1.43	7670	<DL	38.5	<DL	<DL
47	6D	1.66	1.02	6820	<DL	12.9	<DL	<DL
47	6E	2.96	1.23	11600	<DL	26.2	<DL	<DL
47	6F	3.03	<DL	11400	<DL	28.4	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
47	BCAL	<DL	<DL	120	<DL	10.9	<DL	<DL
47	BDOL	<DL	<DL	12.7	<DL	199	<DL	<DL
47	R3	<DL	<DL	<DL	<DL	<DL	<DL	<DL
49	1A	<DL	1.17	1570	<DL	18.3	<DL	<DL
49	1B	1.64	2.32	5840	<DL	45.3	<DL	<DL
49	1C	1.7	<DL	6900	<DL	24.3	<DL	<DL
49	1D	1.62	<DL	6610	<DL	26.4	<DL	<DL
49	1E	2.74	<DL	11100	<DL	22	<DL	<DL
49	1F	2.8	<DL	10700	<DL	26.4	<DL	<DL
49	2A	<DL	1.47	3650	<DL	41.8	<DL	<DL
49	2B	1.63	2.7	6860	<DL	45.5	<DL	<DL
49	2C	1.52	<DL	6670	<DL	11.8	<DL	<DL
49	2D	1.51	<DL	6670	<DL	21.4	<DL	<DL
49	2E	2.59	<DL	10600	<DL	20.4	<DL	<DL
49	2F	2.78	<DL	10800	<DL	28.6	<DL	<DL
49	3A	<DL	1.88	1730	<DL	15.3	<DL	<DL
49	3B	1.58	1.58	5340	<DL	23.3	<DL	<DL
49	3C	1.63	1.07	6470	<DL	21.9	<DL	<DL
49	3D	1.7	<DL	6720	<DL	23.2	<DL	<DL
49	3E	3.08	<DL	11300	<DL	29.3	<DL	<DL
49	3F	2.93	<DL	11200	<DL	29.8	<DL	<DL
49	4A	<DL	<DL	750	<DL	7.2	<DL	<DL
49	4B	1.48	1.06	5900	<DL	37.3	<DL	<DL
49	4C	1.45	<DL	6460	<DL	30.9	<DL	<DL
49	4D	1.48	<DL	6460	<DL	29.4	<DL	<DL
49	4E	2.69	<DL	10800	<DL	20.3	<DL	<DL
49	4F	2.69	<DL	10400	<DL	25.5	<DL	<DL
49	5A	<DL	1.31	1480	<DL	7.02	<DL	<DL
49	5B	2.53	2.14	10400	<DL	65.9	<DL	<DL
49	5C	1.53	<DL	6850	<DL	20.7	<DL	<DL
49	5D	1.42	<DL	6530	<DL	22.3	<DL	<DL
49	5E	2.53	<DL	10500	<DL	22.2	<DL	<DL
49	5F	2.69	<DL	10700	<DL	26.7	<DL	<DL
49	6A	<DL	1.89	2020	<DL	14	<DL	<DL
49	6B	2.11	2.01	8440	<DL	55	<DL	<DL
49	6C	1.55	<DL	7080	<DL	42	<DL	<DL
49	6D	1.47	<DL	6660	<DL	15	<DL	<DL
49	6E	2.76	<DL	11500	<DL	24.3	<DL	<DL
49	6F	2.63	<DL	11000	<DL	26.2	<DL	<DL
49	BCAL	<DL	<DL	98.6	<DL	8.33	<DL	<DL
49	BDOL	<DL	<DL	16.9	<DL	268	<DL	<DL
49	R4	<DL	<DL	<DL	<DL	<DL	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
53	1A	<DL	1.5	1490	<DL	17	<DL	<DL
53	1B	1.5	2.42	5930	<DL	42.2	<DL	<DL
53	1C	1.56	<DL	6910	<DL	26.5	<DL	<DL
53	1D	1.66	<DL	6320	<DL	26.4	<DL	<DL
53	1E	2.9	<DL	11000	<DL	20.8	<DL	<DL
53	1F	3.06	<DL	11200	<DL	27	<DL	<DL
53	2A	<DL	1.76	4060	<DL	44.4	<DL	<DL
53	2B	1.84	2.56	7700	<DL	54.7	<DL	<DL
53	2C	1.68	<DL	7070	<DL	13.7	<DL	<DL
53	2D	1.24	<DL	5150	<DL	18.5	<DL	<DL
53	2E	2.8	<DL	11000	<DL	21.2	<DL	<DL
53	2F	3.04	<DL	11300	<DL	29	<DL	<DL
53	3A	<DL	1.13	2430	<DL	20	<DL	<DL
53	3B	1.39	<DL	5610	<DL	23.9	<DL	<DL
53	3C	1.51	<DL	6680	<DL	22.2	<DL	<DL
53	3D	1.37	<DL	6020	<DL	23.3	<DL	<DL
53	3E	2.88	n.d.	11355	n.d.	28.2	n.d.	n.d.
53	3F	2.92	<DL	11200	<DL	28.3	<DL	<DL
53	4A	<DL	<DL	1780	<DL	21	<DL	<DL
53	4B	1.56	<DL	6630	<DL	44.1	<DL	<DL
53	4C	1.48	<DL	6790	<DL	31.6	<DL	<DL
53	4D	1.47	<DL	6630	<DL	33	<DL	<DL
53	4E	2.6	<DL	10800	<DL	20.2	<DL	<DL
53	4F	2.66	<DL	10800	<DL	26.8	<DL	<DL
53	5A	<DL	1.48	2130	<DL	14.2	<DL	<DL
53	5B	2.99	1.34	12200	<DL	87	<DL	<DL
53	5C	1.63	<DL	7180	<DL	24.3	<DL	<DL
53	5D	1.56	<DL	7210	<DL	30.4	<DL	<DL
53	5E	2.52	<DL	10500	<DL	22.2	<DL	<DL
53	5F	2.85	<DL	11600	<DL	28.3	<DL	<DL
53	6A	<DL	1.27	2300	<DL	14.9	<DL	<DL
53	6B	2.15	<DL	9050	<DL	56.6	<DL	<DL
53	6C	1.6	<DL	7440	<DL	46.4	<DL	<DL
53	6D	1.38	<DL	6530	<DL	16	<DL	<DL
53	6E	2.61	<DL	11300	<DL	23.9	<DL	<DL
53	6F	2.59	<DL	10900	<DL	27	<DL	<DL
53	BCAL	<DL	<DL	104	<DL	8.02	<DL	<DL
53	BDOL	<DL	<DL	14.7	<DL	176	<DL	<DL
53	R5	<DL	<DL	<DL	<DL	<DL	<DL	<DL
56	1A	<DL	1.85	1960	<DL	23.8	<DL	<DL
56	1B	1.6	2.44	5520	<DL	44.7	<DL	<DL
56	1C	1.75	<DL	6790	<DL	32.6	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
56	1D	1.61	<DL	6430	<DL	35.7	<DL	<DL
56	1E	2.76	<DL	10600	<DL	23.5	<DL	<DL
56	1F	2.92	<DL	10900	<DL	32	<DL	<DL
56	2A	<DL	1.84	3880	<DL	40.5	<DL	<DL
56	2B	1.81	2.47	7310	<DL	51.8	<DL	<DL
56	2C	1.04	<DL	5020	<DL	19.4	<DL	<DL
56	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
56	2E	2.64	<DL	10600	<DL	24.9	<DL	<DL
56	2F	2.88	<DL	11100	<DL	34.8	<DL	<DL
56	3A	<DL	2.82	2480	<DL	23.1	<DL	<DL
56	3B	1.34	1.31	5310	<DL	25.1	<DL	<DL
56	3C	1.4	<DL	6360	<DL	26.5	<DL	<DL
56	3D	1.59	<DL	7010	<DL	29.3	<DL	<DL
56	3E	2.895	n.d.	11340	n.d.	29.7	n.d.	n.d.
56	3F	2.78	<DL	11200	<DL	33.5	<DL	<DL
56	4A	<DL	<DL	1710	<DL	17.6	<DL	<DL
56	4B	1.46	1.15	6180	<DL	45.1	<DL	<DL
56	4C	1.4	<DL	6390	<DL	38.6	<DL	<DL
56	4D	1.4	<DL	6480	<DL	39.9	<DL	<DL
56	4E	2.56	1.01	10500	<DL	23.2	<DL	<DL
56	4F	2.65	<DL	10700	<DL	32.5	<DL	<DL
56	5A	<DL	2.21	1910	<DL	14.9	<DL	<DL
56	5B	2.86	2.19	12100	<DL	108	<DL	<DL
56	5C	1.55	1.07	7070	<DL	33.1	<DL	<DL
56	5D	1.53	<DL	6960	<DL	42.2	<DL	<DL
56	5E	2.54	<DL	10500	<DL	27.1	<DL	<DL
56	5F	2.67	<DL	10800	<DL	32.4	<DL	<DL
56	6A	<DL	2.52	2590	<DL	15	<DL	<DL
56	6B	2.28	2.17	8140	<DL	54.3	<DL	<DL
56	6C	1.78	1.06	7290	<DL	49.3	<DL	<DL
56	6D	1.5	<DL	6360	<DL	18.6	<DL	<DL
56	6E	2.75	<DL	10900	<DL	27.8	<DL	<DL
56	6F	2.7	<DL	10700	<DL	32.8	<DL	<DL
56	BCAL	<DL	<DL	85.7	<DL	9.1	<DL	<DL
56	BDOL	<DL	<DL	<DL	<DL	207	<DL	<DL
56	R6	<DL	<DL	<DL	<DL	<DL	<DL	<DL
60	1A	<DL	1.94	2080	<DL	22.6	<DL	<DL
60	1B	1.48	2.24	5670	<DL	44.2	<DL	<DL
60	1C	1.59	<DL	6930	<DL	34.5	<DL	<DL
60	1D	1.46	<DL	6480	<DL	40.8	<DL	<DL
60	1E	2.54	<DL	10600	<DL	24.5	<DL	<DL
60	1F	2.75	<DL	11000	<DL	31.8	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
60	2A	<DL	2.15	3940	<DL	37.4	<DL	<DL
60	2B	1.75	2.43	7670	<DL	54	<DL	<DL
60	2C	1.51	<DL	6840	<DL	22.5	<DL	<DL
60	2D	1.62	n.d.	7455	n.d.	36.9	n.d.	n.d.
60	2E	2.5	<DL	10500	<DL	25.5	<DL	<DL
60	2F	2.77	<DL	11200	<DL	34.8	<DL	<DL
60	3A	<DL	2.4	2200	<DL	20.2	<DL	<DL
60	3B	1.25	1.28	5400	<DL	25.8	<DL	<DL
60	3C	1.33	<DL	6430	<DL	27.9	<DL	<DL
60	3D	1.35	<DL	6160	<DL	26.9	<DL	<DL
60	3E	2.67	n.d.	10980	n.d.	33.15	n.d.	n.d.
60	3F	2.67	<DL	10900	<DL	34.1	<DL	<DL
60	4A	<DL	<DL	2490	<DL	24.4	<DL	<DL
60	4B	1.51	<DL	6600	<DL	47.2	<DL	<DL
60	4C	1.37	<DL	6550	<DL	43.3	<DL	<DL
60	4D	1.59	<DL	6450	<DL	44	<DL	<DL
60	4E	2.74	<DL	10400	<DL	23.9	<DL	<DL
60	4F	2.81	<DL	10800	<DL	32.7	<DL	<DL
60	5A	<DL	3.03	2930	<DL	24.6	<DL	<DL
60	5B	3.13	2.43	12400	<DL	106	<DL	<DL
60	5C	1.66	1.11	7230	<DL	42.7	<DL	<DL
60	5D	1.67	<DL	7330	<DL	47.9	<DL	<DL
60	5E	2.58	<DL	10400	<DL	29.4	<DL	<DL
60	5F	2.72	<DL	10800	<DL	35.1	<DL	<DL
60	6A	<DL	2.48	2770	<DL	15.9	<DL	<DL
60	6B	2.02	1.82	8200	<DL	55	<DL	<DL
60	6C	1.61	<DL	7480	<DL	50.2	<DL	<DL
60	6D	1.41	<DL	6480	<DL	18.4	<DL	<DL
60	6E	2.58	<DL	10900	<DL	28.2	<DL	<DL
60	6F	2.61	<DL	10800	<DL	32.7	<DL	<DL
60	BCAL	<DL	<DL	53	<DL	7.69	<DL	<DL
60	BDOL	<DL	<DL	<DL	<DL	183	<DL	<DL
60	R1	<DL	<DL	<DL	<DL	<DL	<DL	<DL
63	1A	<DL	1.49	2060	<DL	21	<DL	<DL
63	1B	1.56	1.83	5540	<DL	39.1	<DL	<DL
63	1C	1.66	<DL	6750	<DL	34.2	<DL	<DL
63	1D	1.61	<DL	6800	<DL	43	<DL	<DL
63	1E	2.61	<DL	10500	<DL	23.1	<DL	<DL
63	1F	2.81	<DL	10800	<DL	30.9	<DL	<DL
63	2A	<DL	1.13	3080	<DL	25.6	<DL	<DL
63	2B	1.83	1.98	7880	<DL	51.6	<DL	<DL
63	2C	1.59	<DL	6890	<DL	26.2	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
63	2D	1.47	<DL	6330	<DL	45.6	<DL	<DL
63	2E	2.55	<DL	10400	<DL	25.6	<DL	<DL
63	2F	2.75	<DL	10700	<DL	34.1	<DL	<DL
63	3A	<DL	1.88	2310	<DL	18.9	<DL	<DL
63	3B	1.51	1.15	5300	<DL	24.1	<DL	<DL
63	3C	1.58	<DL	6430	<DL	28.2	<DL	<DL
63	3D	1.54	<DL	6300	<DL	25.4	<DL	<DL
63	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
63	3F	2.89	<DL	11000	<DL	32.9	<DL	<DL
63	4A	<DL	<DL	2160	<DL	19.4	<DL	<DL
63	4B	1.68	<DL	6700	<DL	44.8	<DL	<DL
63	4C	1.5	<DL	6590	<DL	46.3	<DL	<DL
63	4D	1.44	<DL	6360	<DL	45.5	<DL	<DL
63	4E	2.62	<DL	10500	<DL	24.9	<DL	<DL
63	4F	2.64	<DL	10500	<DL	33.9	<DL	<DL
63	5A	<DL	2.59	2770	<DL	18.1	<DL	<DL
63	5B	2.74	2.28	11000	<DL	88.8	<DL	<DL
63	5C	1.73	<DL	7360	<DL	48.4	<DL	<DL
63	5D	1.68	<DL	7340	<DL	52	<DL	<DL
63	5E	2.56	<DL	10400	<DL	30.1	<DL	<DL
63	5F	2.69	<DL	10600	<DL	34.8	<DL	<DL
63	6A	<DL	1.65	3420	<DL	14.8	<DL	<DL
63	6B	2.04	1.69	8360	<DL	51.8	<DL	<DL
63	6C	1.61	<DL	7450	<DL	48.9	<DL	<DL
63	6D	1.44	<DL	6600	<DL	19.3	<DL	<DL
63	6E	2.6	<DL	10900	<DL	27.8	<DL	<DL
63	6F	2.6	<DL	10700	<DL	32.7	<DL	<DL
63	BCAL	<DL	<DL	70.8	<DL	7.8	<DL	<DL
63	BDOL	<DL	<DL	<DL	<DL	180	<DL	<DL
63	R2	<DL	<DL	<DL	<DL	<DL	<DL	<DL
67	1A	<DL	<DL	1500	<DL	15.6	<DL	<DL
67	1B	1.49	1.9	6140	<DL	42.2	<DL	<DL
67	1C	1.55	<DL	6800	<DL	33.1	<DL	<DL
67	1D	1.82	<DL	7040	<DL	47.1	<DL	<DL
67	1E	2.7	<DL	10500	<DL	23.4	<DL	<DL
67	1F	2.79	<DL	10700	<DL	31.2	<DL	<DL
67	2A	<DL	1.3	3390	<DL	28.4	<DL	<DL
67	2B	1.89	2.33	7950	<DL	53.9	<DL	<DL
67	2C	1.59	<DL	6920	<DL	28.6	<DL	<DL
67	2D	1.65	<DL	6930	<DL	50	<DL	<DL
67	2E	2.58	<DL	10400	<DL	27.7	<DL	<DL
67	2F	2.8	<DL	10900	<DL	34.2	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
67	3A	<DL	1.54	2570	<DL	20.4	<DL	<DL
67	3B	1.28	<DL	5450	<DL	23.8	<DL	<DL
67	3C	1.37	<DL	6390	<DL	29.5	<DL	<DL
67	3D	1.57	<DL	6940	<DL	30.7	<DL	<DL
67	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
67	3F	2.69	<DL	11100	<DL	33.4	<DL	<DL
67	4A	<DL	<DL	2710	<DL	23.7	<DL	<DL
67	4B	1.56	<DL	6830	<DL	43.1	<DL	<DL
67	4C	1.41	<DL	6660	<DL	48.8	<DL	<DL
67	4D	1.47	<DL	6780	<DL	53	<DL	<DL
67	4E	2.49	<DL	10300	<DL	26.5	<DL	<DL
67	4F	2.5	<DL	10400	<DL	37.3	<DL	<DL
67	5A	<DL	2.65	2940	<DL	19	<DL	<DL
67	5B	2.42	1.63	10100	<DL	78.2	<DL	<DL
67	5C	1.67	<DL	7460	<DL	52.3	<DL	<DL
67	5D	1.75	<DL	7780	<DL	59.3	<DL	<DL
67	5E	2.63	<DL	10600	<DL	32.3	<DL	<DL
67	5F	2.7	<DL	11000	<DL	39.5	<DL	<DL
67	6A	<DL	1.45	4010	<DL	18.4	<DL	<DL
67	6B	2.06	1.36	8820	<DL	55.3	<DL	<DL
67	6C	1.64	<DL	7480	<DL	60.4	<DL	<DL
67	6D	1.47	<DL	6890	<DL	21.4	<DL	<DL
67	6E	2.57	<DL	11200	<DL	28.7	<DL	<DL
67	6F	2.53	<DL	11100	<DL	35.8	<DL	<DL
67	BCAL	<DL	<DL	128	<DL	9.51	<DL	<DL
67	BDOL	<DL	<DL	11.5	<DL	159	<DL	<DL
67	R3	<DL	<DL	<DL	<DL	<DL	<DL	<DL
70	1A	<DL	1.11	1180	<DL	12.7	<DL	<DL
70	1B	1.85	2.28	6850	<DL	47.8	<DL	<DL
70	1C	1.63	<DL	6870	<DL	34	<DL	<DL
70	1D	1.64	<DL	7000	<DL	50.4	<DL	<DL
70	1E	2.67	<DL	10600	<DL	23.5	<DL	<DL
70	1F	2.83	<DL	10800	<DL	29.9	<DL	<DL
70	2A	<DL	1.58	3510	<DL	26.7	<DL	<DL
70	2B	1.8	2.27	8010	<DL	53.9	<DL	<DL
70	2C	1.55	<DL	7040	<DL	31.3	<DL	<DL
70	2D	1.65	<DL	7200	<DL	55.7	<DL	<DL
70	2E	2.55	<DL	10600	<DL	27.3	<DL	<DL
70	2F	2.76	<DL	11000	<DL	33.6	<DL	<DL
70	3A	<DL	1.91	3080	<DL	23.3	<DL	<DL
70	3B	1.25	<DL	5500	<DL	20.8	<DL	<DL
70	3C	1.37	<DL	6620	<DL	28.8	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
70	3D	1.5	<DL	7120	<DL	29.3	<DL	<DL
70	3E	2.49	<DL	10300	2.42	28.2	<DL	<DL
70	3F	2.63	<DL	11100	<DL	34	<DL	<DL
70	4A	<DL	<DL	2610	<DL	23.1	<DL	<DL
70	4B	1.53	<DL	6940	<DL	38.6	<DL	<DL
70	4C	1.38	<DL	6760	<DL	51.1	<DL	<DL
70	4D	1.44	<DL	7050	<DL	54.5	<DL	<DL
70	4E	2.47	<DL	10700	<DL	26	<DL	<DL
70	4F	2.45	<DL	10600	<DL	38.9	<DL	<DL
70	5A	<DL	3.61	3440	<DL	18.2	<DL	<DL
70	5B	2.31	2.08	9980	<DL	68.9	<DL	<DL
70	5C	1.63	1.24	7700	<DL	57.1	<DL	<DL
70	5D	1.73	1.01	8050	<DL	63	<DL	<DL
70	5E	2.48	<DL	10600	<DL	35.2	<DL	<DL
70	5F	2.57	<DL	10700	<DL	39.5	<DL	<DL
70	6A	<DL	1.99	2260	<DL	11	<DL	<DL
70	6B	2.2	1.73	8520	<DL	49.7	<DL	<DL
70	6C	1.72	1.05	7620	<DL	53	<DL	<DL
70	6D	1.47	1.06	6720	<DL	20.7	<DL	<DL
70	6E	2.68	1.38	11000	<DL	28.5	<DL	<DL
70	6F	2.48	<DL	10800	<DL	33.8	<DL	<DL
70	BCAL	<DL	<DL	56.7	<DL	8	<DL	<DL
70	BDOL	<DL	<DL	13.5	<DL	142	<DL	<DL
70	R4	<DL	<DL	38.4	<DL	1.62	<DL	<DL
74	1A	<DL	1.29	1660	<DL	15.3	<DL	<DL
74	1B	1.19	1.74	5150	<DL	36.8	<DL	<DL
74	1C	1.5	<DL	7130	<DL	37.4	<DL	<DL
74	1D	1.53	<DL	7310	<DL	53.1	<DL	<DL
74	1E	2.38	<DL	10700	<DL	24.2	<DL	<DL
74	1F	2.47	<DL	10900	<DL	30.3	<DL	<DL
74	2A	<DL	1.56	3800	<DL	27.3	<DL	<DL
74	2B	1.74	2.4	8310	<DL	50.5	<DL	<DL
74	2C	1.44	<DL	7070	<DL	32	<DL	<DL
74	2D	1.7	<DL	7730	<DL	57.6	<DL	<DL
74	2E	2.47	<DL	10800	<DL	30	<DL	<DL
74	2F	2.66	<DL	11200	<DL	34.1	<DL	<DL
74	3A	<DL	1.54	3060	<DL	19.6	<DL	<DL
74	3B	1.26	1.06	5760	<DL	20.4	<DL	<DL
74	3C	1.31	<DL	6770	<DL	27.8	<DL	<DL
74	3D	1.46	<DL	7130	<DL	28.9	<DL	<DL
74	3E	2.35	<DL	10300	<DL	28.4	<DL	<DL
74	3F	2.58	<DL	11400	<DL	38.5	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
74	4A	<DL	1.13	3400	<DL	27.2	<DL	<DL
74	4B	1.5	<DL	7020	<DL	37.8	<DL	<DL
74	4C	<DL	<DL	3890	<DL	35.9	<DL	<DL
74	4D	1.81	<DL	7270	<DL	55.4	<DL	<DL
74	4E	2.71	<DL	10900	<DL	28	<DL	<DL
74	4F	2.67	<DL	10900	<DL	45	<DL	<DL
74	5A	<DL	3.36	3720	<DL	19.1	<DL	<DL
74	5B	2.37	2.11	10000	<DL	65.6	<DL	<DL
74	5C	1.75	1.16	7940	<DL	59.9	<DL	<DL
74	5D	1.84	<DL	8370	<DL	67.3	<DL	<DL
74	5E	2.52	<DL	10800	<DL	39.8	<DL	<DL
74	5F	2.67	<DL	11200	<DL	44.4	<DL	<DL
74	6A	<DL	2.42	4370	<DL	16.1	<DL	<DL
74	6B	1.87	1.45	8480	<DL	46.4	<DL	<DL
74	6C	1.56	<DL	7710	<DL	50.8	<DL	<DL
74	6D	1.38	<DL	6930	<DL	24.2	<DL	<DL
74	6E	2.52	<DL	11200	<DL	30.3	<DL	<DL
74	6F	2.51	<DL	11100	<DL	36.9	<DL	<DL
74	BCAL	<DL	<DL	61.5	<DL	7.82	<DL	<DL
74	BDOL	<DL	<DL	<DL	<DL	162	<DL	<DL
74	R5	<DL	<DL	<DL	<DL	<DL	<DL	<DL
77	1A	<DL	1.02	1420	<DL	12.6	<DL	<DL
77	1B	1.75	1.94	6880	<DL	43.9	<DL	<DL
77	1C	1.5	<DL	6640	<DL	35.9	<DL	<DL
77	1D	1.55	<DL	6760	<DL	51.5	<DL	<DL
77	1E	2.4	<DL	10200	<DL	25.3	<DL	<DL
77	1F	2.46	<DL	10100	<DL	29.5	<DL	<DL
77	2A	<DL	1.05	3840	<DL	26.2	<DL	<DL
77	2B	1.66	1.94	7500	<DL	46.4	<DL	<DL
77	2C	1.45	<DL	6840	<DL	34.3	<DL	<DL
77	2D	1.55	<DL	6990	<DL	59.7	<DL	<DL
77	2E	2.39	<DL	10100	<DL	31.6	<DL	<DL
77	2F	2.55	<DL	10300	<DL	34.2	<DL	<DL
77	3A	<DL	1.65	2570	<DL	16.7	<DL	<DL
77	3B	1.4	1.18	5150	<DL	18.4	<DL	<DL
77	3C	1.45	<DL	6290	<DL	26.1	<DL	<DL
77	3D	1.54	<DL	6460	<DL	26.7	<DL	<DL
77	3E	2.49	<DL	9550	<DL	27	<DL	<DL
77	3F	2.63	<DL	10700	<DL	40.8	<DL	<DL
77	4A	<DL	1.21	3670	<DL	31.2	<DL	<DL
77	4B	1.46	<DL	6290	<DL	33.8	<DL	<DL
77	4C	1.41	<DL	6610	<DL	47.9	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
77	4D	1.45	<DL	6790	<DL	52.9	<DL	<DL
77	4E	2.35	<DL	10000	<DL	27.9	<DL	<DL
77	4F	2.48	<DL	10400	<DL	46.5	<DL	<DL
77	5A	<DL	3.31	3920	<DL	19.4	<DL	<DL
77	5B	2.12	1.25	9120	<DL	59.3	<DL	<DL
77	5C	1.66	<DL	7530	<DL	62.5	<DL	<DL
77	5D	1.67	<DL	7570	<DL	66.8	<DL	<DL
77	5E	2.44	<DL	10200	<DL	39.6	<DL	<DL
77	5F	2.48	<DL	10200	<DL	45.4	<DL	<DL
77	6A	<DL	1.35	3470	<DL	11.7	<DL	<DL
77	6B	1.75	1.04	7780	<DL	41.4	<DL	<DL
77	6C	1.47	<DL	7300	<DL	49.7	<DL	<DL
77	6D	1.3	<DL	6360	<DL	23.8	<DL	<DL
77	6E	2.42	<DL	10600	<DL	31.7	<DL	<DL
77	6F	2.33	<DL	10100	<DL	37.3	<DL	<DL
77	BCAL	<DL	<DL	44.8	<DL	7.75	<DL	<DL
77	BDOL	<DL	<DL	<DL	<DL	126	<DL	<DL
77	R6	<DL	<DL	<DL	<DL	<DL	<DL	<DL
82	1A	<DL	<DL	2060	<DL	18.6	<DL	<DL
82	1B	1.8	1.53	8240	<DL	50.6	<DL	<DL
82	1C	1.41	<DL	6800	<DL	37.9	<DL	<DL
82	1D	1.72	<DL	6590	<DL	51.2	<DL	<DL
82	1E	2.49	<DL	10000	<DL	27.4	<DL	<DL
82	1F	2.54	<DL	9770	<DL	31.1	<DL	<DL
82	2A	<DL	1.3	3930	<DL	28.1	<DL	<DL
82	2B	1.8	2.13	7790	<DL	55.8	<DL	<DL
82	2C	1.54	<DL	6930	<DL	40	<DL	<DL
82	2D	1.755	n.d.	7395	n.d.	70.95	n.d.	n.d.
82	2E	2.41	<DL	10100	<DL	36.2	<DL	<DL
82	2F	2.55	<DL	10100	<DL	35.4	<DL	<DL
82	3A	<DL	1.08	2920	<DL	18.5	<DL	<DL
82	3B	1.21	<DL	5430	<DL	19.1	<DL	<DL
82	3C	1.26	<DL	6260	<DL	24.9	<DL	<DL
82	3D	1.31	<DL	6180	<DL	25.6	<DL	<DL
82	3E	2.28	<DL	9420	<DL	26	<DL	<DL
82	3F	2.42	<DL	10500	<DL	46.1	<DL	<DL
82	4A	<DL	<DL	2140	<DL	17.9	<DL	<DL
82	4B	1.43	<DL	6700	<DL	35.4	<DL	<DL
82	4C	1.32	<DL	6800	<DL	44.8	<DL	<DL
82	4D	1.34	<DL	6650	<DL	51.7	<DL	<DL
82	4E	2.22	<DL	10000	<DL	29.5	<DL	<DL
82	4F	2.29	<DL	10000	<DL	49.4	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
82	5A	<DL	2.76	3820	<DL	62.3	<DL	<DL
82	5B	2	1.68	8870	<DL	55.5	<DL	<DL
82	5C	1.65	<DL	7750	<DL	62.7	<DL	<DL
82	5D	1.64	<DL	7720	<DL	66.5	<DL	<DL
82	5E	2.34	<DL	10100	<DL	41.3	<DL	<DL
82	5F	2.39	<DL	9970	<DL	47.3	<DL	<DL
82	6A	1.11	<DL	5210	<DL	16.2	<DL	<DL
82	6B	1.73	1.03	7860	<DL	38.5	<DL	<DL
82	6C	1.38	<DL	7030	<DL	44.6	<DL	<DL
82	6D	1.21	<DL	6250	<DL	23.8	<DL	<DL
82	6E	2.41	<DL	10600	<DL	32	<DL	<DL
82	6F	2.23	<DL	9850	<DL	39.9	<DL	<DL
82	BCAL	<DL	<DL	30.9	<DL	6.85	<DL	<DL
82	BDOL	<DL	<DL	<DL	<DL	120	<DL	<DL
82	R1	<DL	<DL	<DL	<DL	<DL	<DL	<DL
84	1A	<DL	1.5	1600	<DL	15.7	<DL	<DL
84	1B	2.92	3.17	7320	<DL	44.8	<DL	<DL
84	1C	2.56	2.23	7000	<DL	42.9	<DL	<DL
84	1D	2.53	2.02	7160	<DL	64.2	<DL	<DL
84	1E	3.91	1.76	10700	<DL	30.7	<DL	<DL
84	1F	4.05	1.41	10900	<DL	35	<DL	<DL
84	2A	1.16	2.82	3830	<DL	24.3	<DL	<DL
84	2B	2.79	3.64	8060	<DL	52.6	<DL	<DL
84	2C	2.46	1.86	7330	<DL	47.3	<DL	<DL
84	2D	2.39	2.07	7040	<DL	69.3	<DL	<DL
84	2E	3.96	1.22	10900	<DL	39	<DL	<DL
84	2F	4.2	1.29	11100	<DL	38.6	<DL	<DL
84	3A	1.06	2.81	3210	<DL	19.1	<DL	<DL
84	3B	2.12	1.9	5800	<DL	18.9	<DL	<DL
84	3C	2.29	1.25	6880	<DL	26.7	<DL	<DL
84	3D	2.55	1.27	7240	<DL	29.6	<DL	<DL
84	3E	3.9	1.32	10300	<DL	27.6	<DL	<DL
84	3F	4.45	1.28	12100	<DL	50.1	<DL	<DL
84	4A	<DL	1.53	2670	<DL	23.4	<DL	<DL
84	4B	2.45	1.5	6810	<DL	31.8	<DL	<DL
84	4C	2.56	1.62	7460	<DL	48.7	<DL	<DL
84	4D	2.55	1.25	7600	<DL	57.3	<DL	<DL
84	4E	4.01	1.69	11100	<DL	31.9	<DL	<DL
84	4F	4.09	1.4	11400	<DL	53.9	<DL	<DL
84	5A	1.74	5.67	5000	<DL	20	<DL	<DL
84	5B	3.21	4.19	8920	<DL	54	<DL	<DL
84	5C	3.03	2.39	8730	<DL	79.6	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
84	5D	2.92	1.98	8900	<DL	84	<DL	<DL
84	5E	3.88	2.27	11200	<DL	43.7	<DL	<DL
84	5F	4.01	1.38	11100	<DL	48.8	<DL	<DL
84	6A	1.93	4.48	4550	<DL	15.4	<DL	<DL
84	6B	3.1	4.4	8240	<DL	34.7	<DL	<DL
84	6C	2.66	2.77	8120	<DL	45	<DL	<DL
84	6D	2.45	2.57	7360	<DL	27.3	<DL	<DL
84	6E	4.26	2.02	12200	<DL	33.5	<DL	<DL
84	6F	4.18	1.87	11700	<DL	42.9	<DL	<DL
84	BCAL	<DL	2.24	79.9	<DL	8.04	<DL	<DL
84	BDOL	<DL	1.54	19.7	<DL	168	<DL	<DL
84	R2	<DL	1.27	<DL	<DL	<DL	<DL	<DL
88	1A	1.03	3.17	2790	<DL	23.7	<DL	<DL
88	1B	2.64	4.2	7480	<DL	40.3	<DL	<DL
88	1C	2.54	2.19	7530	<DL	43.5	<DL	<DL
88	1D	2.67	2.26	7870	<DL	66.3	<DL	<DL
88	1E	3.92	2.3	11300	<DL	34.1	<DL	<DL
88	1F	4.07	1.96	11400	<DL	36.8	<DL	<DL
88	2A	1.71	3.91	5130	<DL	30.2	<DL	<DL
88	2B	2.88	4.29	8450	<DL	41.6	<DL	<DL
88	2C	2.75	2.31	8060	<DL	43.4	<DL	<DL
88	2D	3.165	3.15	8805	n.d.	75	n.d.	n.d.
88	2E	4.14	2.04	11600	<DL	42.4	<DL	<DL
88	2F	4.4	1.61	12000	<DL	39.2	<DL	<DL
88	3A	1.43	3.28	4140	<DL	22.2	<DL	<DL
88	3B	2.33	2.68	6220	<DL	19.5	<DL	<DL
88	3C	2.42	2.25	7380	<DL	26.9	<DL	<DL
88	3D	2.745	2.73	7785	n.d.	51	n.d.	n.d.
88	3E	3.97	2.51	11100	<DL	28.7	<DL	<DL
88	3F	4.52	2.4	12900	<DL	57	<DL	<DL
88	4A	n.d.	3.96	3840	n.d.	33.9	n.d.	n.d.
88	4B	2.57	3.03	7370	<DL	31.9	<DL	<DL
88	4C	2.54	2.7	8000	<DL	40	<DL	<DL
88	4D	3.24	4.17	8380	<DL	58.2	<DL	<DL
88	4E	4.33	3.58	11900	<DL	36.2	<DL	<DL
88	4F	4.56	2.84	12600	<DL	59.3	<DL	<DL
88	5A	2.2	9.31	5890	<DL	25.9	<DL	<DL
88	5B	3.81	5.86	10500	<DL	56.7	<DL	<DL
88	5C	3.3	3.63	9370	<DL	71.5	<DL	<DL
88	5D	3.37	3.09	9730	<DL	73.8	<DL	<DL
88	5E	4.3	3.31	12000	<DL	46.1	<DL	<DL
88	5F	4.63	2.96	12800	<DL	54.8	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
88	6A	2.18	5.17	5900	<DL	19	<DL	<DL
88	6B	3.29	3.8	9250	<DL	36.5	<DL	<DL
88	6C	2.9	2.96	8700	<DL	44.9	<DL	<DL
88	6D	2.64	3.04	7900	<DL	28.9	<DL	<DL
88	6E	4.58	2.63	12900	<DL	36.3	<DL	<DL
88	6F	4.32	2.66	12400	<DL	47.5	<DL	<DL
88	BCAL	<DL	3.39	75.3	<DL	8.82	<DL	<DL
88	BDOL	<DL	2.36	26.1	<DL	119	<DL	<DL
88	R3	<DL	1.98	8.51	<DL	<DL	<DL	<DL
91	1A	<DL	<DL	2340	<DL	50.9	<DL	<DL
91	1B	2.01	1.9	5880	<DL	35.2	<DL	<DL
91	1C	1.94	<DL	6420	<DL	40.8	<DL	<DL
91	1D	1.92	<DL	6540	<DL	55.8	<DL	<DL
91	1E	2.84	<DL	9370	<DL	32.6	<DL	<DL
91	1F	3.03	<DL	9580	<DL	36.6	<DL	<DL
91	2A	1.06	<DL	4210	<DL	27	<DL	<DL
91	2B	2.08	2.38	7230	<DL	36.3	<DL	<DL
91	2C	1.81	<DL	6440	<DL	37.7	<DL	<DL
91	2D	2.97	n.d.	10170	n.d.	93.9	n.d.	n.d.
91	2E	2.96	<DL	9630	<DL	37.8	<DL	<DL
91	2F	3.14	<DL	9790	<DL	34	<DL	<DL
91	3A	1.02	<DL	2810	<DL	15.7	<DL	<DL
91	3B	2.04	1.76	5430	<DL	19	<DL	<DL
91	3C	2.07	1.01	6580	<DL	25.2	<DL	<DL
91	3D	1.49	<DL	4600	<DL	18.2	<DL	<DL
91	3E	3.33	<DL	9590	<DL	26.9	<DL	<DL
91	3F	3.88	<DL	11400	<DL	52	<DL	<DL
91	4A	<DL	<DL	2230	<DL	25.1	<DL	<DL
91	4B	2.06	<DL	6620	<DL	30.1	<DL	<DL
91	4C	1.93	<DL	6560	<DL	35.8	<DL	<DL
91	4D	1.99	<DL	6830	<DL	46.4	<DL	<DL
91	4E	3.24	<DL	10100	<DL	33.4	<DL	<DL
91	4F	3.55	<DL	10900	<DL	58.1	<DL	<DL
91	5A	1.52	4.68	5040	<DL	22.1	<DL	<DL
91	5B	2.93	2.82	8860	<DL	49.1	<DL	<DL
91	5C	2.48	<DL	8080	<DL	62.2	<DL	<DL
91	5D	2.47	<DL	8260	<DL	61.5	<DL	<DL
91	5E	3.29	<DL	10400	<DL	44	<DL	<DL
91	5F	3.49	<DL	10500	<DL	49.4	<DL	<DL
91	6A	1.81	1.75	5750	<DL	18.2	<DL	<DL
91	6B	2.49	1.08	7920	<DL	34.9	<DL	<DL
91	6C	2.16	<DL	7450	<DL	39.3	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
91	6D	1.94	<DL	6730	<DL	26	<DL	<DL
91	6E	3.36	<DL	10700	<DL	32.3	<DL	<DL
91	6F	3.43	<DL	11000	<DL	45.5	<DL	<DL
91	BCAL	<DL	<DL	55	<DL	6.2	<DL	<DL
91	BDOL	<DL	<DL	14.3	<DL	117	<DL	<DL
91	R4	<DL	<DL	<DL	<DL	<DL	<DL	<DL
95	1A	<DL	2.02	2920	<DL	53.8	<DL	<DL
95	1B	2.08	2.1	6490	<DL	37.7	<DL	<DL
95	1C	2.13	<DL	7120	<DL	43.1	<DL	<DL
95	1D	2.76	1.78	7280	<DL	62.8	<DL	<DL
95	1E	3.48	1.02	10300	<DL	37.6	<DL	<DL
95	1F	3.81	<DL	10900	<DL	43.5	<DL	<DL
95	2A	1.33	1.86	4580	<DL	31.5	<DL	<DL
95	2B	2.57	2.29	8010	<DL	37.5	<DL	<DL
95	2C	2.29	1.63	7380	<DL	43.6	<DL	<DL
95	2D	2.67	2.73	8040	n.d.	73.65	n.d.	n.d.
95	2E	3.51	<DL	10700	<DL	43.3	<DL	<DL
95	2F	3.62	<DL	10600	<DL	37.2	<DL	<DL
95	3A	1.06	1.5	3630	<DL	18.9	<DL	<DL
95	3B	1.84	1.58	5560	<DL	19.5	<DL	<DL
95	3C	1.84	<DL	6380	<DL	25.5	<DL	<DL
95	3D	1.965	n.d.	6540	n.d.	26.85	n.d.	n.d.
95	3E	3.12	1.16	9600	<DL	25.8	<DL	<DL
95	3F	3.61	<DL	11100	<DL	48.1	<DL	<DL
95	4A	1.13	7.63	3380	<DL	35.1	<DL	<DL
95	4B	2.15	1.57	6660	<DL	31.5	<DL	<DL
95	4C	2.01	1.03	6840	<DL	35.3	<DL	<DL
95	4D	2.14	1.24	7200	<DL	48.1	<DL	<DL
95	4E	3.3	<DL	10400	<DL	36.7	<DL	<DL
95	4F	3.38	<DL	10600	<DL	54.8	<DL	<DL
95	5A	n.d.	5.445	4470	n.d.	20.1	n.d.	n.d.
95	5B	2.9	2.88	9010	<DL	47.2	<DL	<DL
95	5C	2.44	1.48	7970	<DL	57.6	<DL	<DL
95	5D	2.44	1.29	8160	<DL	55.8	<DL	<DL
95	5E	3.21	<DL	9960	<DL	44.5	<DL	<DL
95	5F	3.33	<DL	10300	<DL	49	<DL	<DL
95	6A	1.545	n.d.	5100	n.d.	16.8	n.d.	n.d.
95	6B	2.58	1.13	8430	<DL	36.7	<DL	<DL
95	6C	2.16	<DL	7480	<DL	37.9	<DL	<DL
95	6D	2.01	<DL	7010	<DL	26.3	<DL	<DL
95	6E	3.4	<DL	11100	<DL	32.7	<DL	<DL
95	6F	3.35	<DL	10700	<DL	46.8	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
95	BCAL	<DL	<DL	45.5	<DL	6.66	<DL	<DL
95	BDOL	<DL	<DL	10.6	<DL	57.8	<DL	<DL
95	R5	<DL	<DL	<DL	<DL	<DL	<DL	<DL
98	1A	1.02	2.7	2830	<DL	41.9	<DL	<DL
98	1B	2.08	2.88	5630	<DL	36.8	<DL	<DL
98	1C	2.47	1.72	7270	<DL	52.4	<DL	<DL
98	1D	2.05	1.88	6290	<DL	61	<DL	<DL
98	1E	3.3	1.67	9880	<DL	45.3	<DL	<DL
98	1F	3.28	<DL	9600	<DL	47.7	<DL	<DL
98	2A	1.2	3.19	4330	<DL	31	<DL	<DL
98	2B	2.19	3.84	7340	<DL	35.8	<DL	<DL
98	2C	2.35	2.37	7680	<DL	50.1	<DL	<DL
98	2D	1.98	2.52	6675	n.d.	70.95	n.d.	n.d.
98	2E	3.14	<DL	10100	<DL	47.5	<DL	<DL
98	2F	3.31	1.03	9850	<DL	40.1	<DL	<DL
98	3A	<DL	2.29	3160	<DL	19.4	<DL	<DL
98	3B	1.71	2.23	5500	<DL	21.2	<DL	<DL
98	3C	1.66	<DL	6080	<DL	29.7	<DL	<DL
98	3D	1.545	n.d.	5655	n.d.	28.8	n.d.	n.d.
98	3E	2.88	<DL	9050	<DL	28.6	<DL	<DL
98	3F	3.34	<DL	10600	<DL	54	<DL	<DL
98	4A	<DL	1.59	2650	<DL	26.9	<DL	<DL
98	4B	1.74	1.59	6140	<DL	32.1	<DL	<DL
98	4C	1.73	<DL	6530	<DL	42	<DL	<DL
98	4D	1.87	1.37	7000	<DL	52.3	<DL	<DL
98	4E	2.8	<DL	9730	<DL	40.8	<DL	<DL
98	4F	3.06	<DL	10100	<DL	61	<DL	<DL
98	5A	<DL	5.7	2630	<DL	19.2	<DL	<DL
98	5B	2.45	3.22	8260	<DL	46.7	<DL	<DL
98	5C	2.01	1.19	7490	<DL	60.1	<DL	<DL
98	5D	2.17	1.67	7920	<DL	60.9	<DL	<DL
98	5E	2.91	1.29	9810	<DL	49.7	<DL	<DL
98	5F	3.31	<DL	10600	<DL	56.2	<DL	<DL
98	6A	1.31	2.91	3520	<DL	14.6	<DL	<DL
98	6B	2.7	2.89	7880	<DL	38.9	<DL	<DL
98	6C	2.22	1.32	7330	<DL	45	<DL	<DL
98	6D	1.67	1.26	5690	<DL	25.3	<DL	<DL
98	6E	3.52	<DL	10800	<DL	36.1	<DL	<DL
98	6F	3.23	<DL	10100	<DL	51.1	<DL	<DL
98	BCAL	<DL	1.34	37.6	<DL	7.32	<DL	<DL
98	BDOL	<DL	1.24	24.4	<DL	123	<DL	<DL
98	R6	<DL	<DL	<DL	<DL	<DL	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
103	1A	1.02	3.14	3570	<DL	44	<DL	<DL
103	1B	1.93	2.95	6180	<DL	40.9	<DL	<DL
103	1C	2.11	1.65	7200	<DL	47.6	<DL	<DL
103	1D	1.77	2.205	6330	n.d.	63.45	n.d.	n.d.
103	1E	3.01	1.17	9850	<DL	51.1	<DL	<DL
103	1F	3.22	<DL	10200	<DL	52.4	<DL	<DL
103	2A	1.31	2.64	5020	<DL	35.1	<DL	<DL
103	2B	2	3.11	7250	<DL	36.5	<DL	<DL
103	2C	2.03	1.33	7190	<DL	46	<DL	<DL
103	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
103	2E	2.99	<DL	9950	<DL	51	<DL	<DL
103	2F	3.08	<DL	9680	<DL	40	<DL	<DL
103	3A	<DL	1.14	3010	<DL	19	<DL	<DL
103	3B	1.55	1.69	5580	<DL	23.4	<DL	<DL
103	3C	1.64	<DL	6100	<DL	31.2	<DL	<DL
103	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
103	3E	2.86	1.04	9260	<DL	31.6	<DL	<DL
103	3F	3.31	<DL	10900	<DL	55.5	<DL	<DL
103	4A	n.d.	2.13	3975	n.d.	51.15	n.d.	n.d.
103	4B	1.81	1.1	6560	<DL	35	<DL	<DL
103	4C	1.65	<DL	6640	<DL	39.1	<DL	<DL
103	4D	2.37	1.85	6870	<DL	51.6	<DL	<DL
103	4E	3.21	<DL	9600	<DL	43.8	<DL	<DL
103	4F	3.4	<DL	10200	<DL	61.6	<DL	<DL
103	5A	1.16	5.61	3880	<DL	19.9	<DL	<DL
103	5B	2.76	3.38	8550	<DL	47.7	<DL	<DL
103	5C	2.19	2.24	7470	<DL	54.8	<DL	<DL
103	5D	2.34	1.8	7940	<DL	58.9	<DL	<DL
103	5E	3.05	1.15	9880	<DL	51.2	<DL	<DL
103	5F	3.29	<DL	10200	<DL	55	<DL	<DL
103	6A	1.39	1.13	4820	<DL	15.1	<DL	<DL
103	6B	2.44	1.63	8380	<DL	39.9	<DL	<DL
103	6C	1.8	<DL	6900	<DL	41	<DL	<DL
103	6D	1.81	1.05	6530	<DL	29.8	<DL	<DL
103	6E	3.05	<DL	10200	<DL	36.3	<DL	<DL
103	6F	3.31	<DL	10800	<DL	52.7	<DL	<DL
103	BCAL	<DL	1.56	41.2	<DL	7.67	<DL	<DL
103	BDOL	<DL	1.55	12.7	<DL	95.4	<DL	<DL
103	R1	<DL	<DL	<DL	<DL	<DL	<DL	<DL
105	1A	<DL	1.88	2860	<DL	43.4	<DL	<DL
105	1B	1.85	1.78	5430	<DL	31.7	<DL	<DL
105	1C	2.41	1.43	7960	<DL	49.1	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
105	1D	1.94	<DL	6820	<DL	58.2	<DL	<DL
105	1E	2.94	<DL	9770	<DL	46.5	<DL	<DL
105	1F	3.22	<DL	10200	<DL	44.9	<DL	<DL
105	2A	1.08	1.39	4040	<DL	23.6	<DL	<DL
105	2B	2.25	2.73	8000	<DL	34.7	<DL	<DL
105	2C	1.99	<DL	7240	<DL	41.7	<DL	<DL
105	2D	2.2	<DL	7410	<DL	65	<DL	<DL
105	2E	2.95	<DL	9860	<DL	46.5	<DL	<DL
105	2F	3.54	<DL	11200	<DL	39.8	<DL	<DL
105	3A	<DL	1.24	2310	<DL	13.4	<DL	<DL
105	3B	2.02	1.72	5660	<DL	21.2	<DL	<DL
105	3C	1.98	<DL	6370	<DL	30.3	<DL	<DL
105	3D	2.15	<DL	6880	<DL	33	<DL	<DL
105	3E	3.01	<DL	9150	<DL	26.1	<DL	<DL
105	3F	3.5	<DL	10700	<DL	47	<DL	<DL
105	4A	1.1	1.22	3730	<DL	35.8	<DL	<DL
105	4B	1.88	<DL	6390	<DL	28.9	<DL	<DL
105	4C	1.86	<DL	6710	<DL	36.9	<DL	<DL
105	4D	1.86	<DL	6810	<DL	46.5	<DL	<DL
105	4E	2.87	<DL	9890	<DL	40.3	<DL	<DL
105	4F	3.1	<DL	10200	<DL	56.1	<DL	<DL
105	5A	1.16	3.28	4210	<DL	16.5	<DL	<DL
105	5B	2.24	1.26	7780	<DL	36.7	<DL	<DL
105	5C	2.18	<DL	7960	<DL	52.1	<DL	<DL
105	5D	2.12	<DL	7790	<DL	50.6	<DL	<DL
105	5E	3.01	<DL	10000	<DL	45.2	<DL	<DL
105	5F	3.12	<DL	10200	<DL	46.8	<DL	<DL
105	6A	1.09	1.21	3870	<DL	9.78	<DL	<DL
105	6B	2.21	1.45	7740	<DL	31.8	<DL	<DL
105	6C	2.12	<DL	7920	<DL	41.8	<DL	<DL
105	6D	1.73	<DL	6620	<DL	27.9	<DL	<DL
105	6E	3.08	<DL	10600	<DL	31	<DL	<DL
105	6F	3	<DL	10200	<DL	44.9	<DL	<DL
105	BCAL	<DL	<DL	36.5	<DL	6.56	<DL	<DL
105	BDOL	<DL	<DL	<DL	<DL	105	<DL	<DL
105	R2	<DL	<DL	<DL	<DL	<DL	<DL	<DL
109	1A	<DL	2.48	2690	<DL	28.7	<DL	<DL
109	1B	1.68	1.88	5560	<DL	32.3	<DL	<DL
109	1C	1.785	1.5	6450	n.d.	37.95	n.d.	n.d.
109	1D	2.37	<DL	6720	<DL	54.7	<DL	<DL
109	1E	3.31	1.08	9810	<DL	49.9	<DL	<DL
109	1F	3.54	<DL	10400	<DL	43.8	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
109	2A	1.3	2.07	4540	<DL	25.3	<DL	<DL
109	2B	2.18	2.11	7400	<DL	32	<DL	<DL
109	2C	2.12	1.36	7090	<DL	39.5	<DL	<DL
109	2D	1.965	n.d.	6480	n.d.	56.7	n.d.	n.d.
109	2E	3.08	<DL	9840	<DL	48.3	<DL	<DL
109	2F	3.3	<DL	10300	<DL	35.9	<DL	<DL
109	3A	<DL	1.47	2400	<DL	11.9	<DL	<DL
109	3B	1.65	1.03	5550	<DL	20.8	<DL	<DL
109	3C	1.7	<DL	6140	<DL	31.1	<DL	<DL
109	3D	1.75	<DL	6220	<DL	30.9	<DL	<DL
109	3E	2.72	<DL	8920	<DL	25.8	<DL	<DL
109	3F	3.45	<DL	10900	<DL	46.3	<DL	<DL
109	4A	<DL	1.33	3300	<DL	29.8	<DL	<DL
109	4B	1.82	<DL	6370	<DL	29.8	<DL	<DL
109	4C	1.77	<DL	6760	<DL	35.6	<DL	<DL
109	4D	1.87	<DL	7120	<DL	48	<DL	<DL
109	4E	2.74	<DL	9730	<DL	42.6	<DL	<DL
109	4F	3	<DL	10300	<DL	54.6	<DL	<DL
109	5A	n.d.	4.905	4470	n.d.	18.9	n.d.	n.d.
109	5B	2.23	1.75	7840	<DL	36.7	<DL	<DL
109	5C	2.07	<DL	7810	<DL	47.8	<DL	<DL
109	5D	2.05	1.03	7720	<DL	46.8	<DL	<DL
109	5E	2.83	<DL	9740	<DL	45.2	<DL	<DL
109	5F	3.14	<DL	10500	<DL	45.8	<DL	<DL
109	6A	1.15	1.9	4010	<DL	11.7	<DL	<DL
109	6B	2.3	1.27	8370	<DL	33.8	<DL	<DL
109	6C	1.81	<DL	7060	<DL	37.4	<DL	<DL
109	6D	1.78	<DL	6840	<DL	29	<DL	<DL
109	6E	3.01	<DL	10400	<DL	31.5	<DL	<DL
109	6F	3.04	<DL	10400	<DL	42.7	<DL	<DL
109	BCAL	<DL	<DL	42.4	<DL	7.23	<DL	<DL
109	BDOL	<DL	<DL	<DL	<DL	93.6	<DL	<DL
109	R3	<DL	<DL	<DL	<DL	<DL	<DL	<DL
112	1A	1.09	1.22	3110	<DL	39.4	<DL	<DL
112	1B	2.1	1.89	5630	<DL	34.9	<DL	<DL
112	1C	2.37	1.1	6980	<DL	42.8	<DL	<DL
112	1D	2.35	1.47	7140	<DL	60.7	<DL	<DL
112	1E	3.39	1.28	9960	<DL	56.6	<DL	<DL
112	1F	3.74	<DL	10500	<DL	46.2	<DL	<DL
112	2A	1.22	2.36	4310	<DL	25.7	<DL	<DL
112	2B	2.36	2.81	7480	<DL	51	<DL	<DL
112	2C	2.24	1.66	7450	<DL	45.1	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
112	2D	2.46	1.73	7890	<DL	67.9	<DL	<DL
112	2E	3.15	<DL	9800	<DL	50.8	<DL	<DL
112	2F	3.5	<DL	10500	<DL	37	<DL	<DL
112	3A	<DL	<DL	2670	<DL	13.8	<DL	<DL
112	3B	1.7	1.88	5470	<DL	20.9	<DL	<DL
112	3C	1.81	1.31	6360	<DL	34.6	<DL	<DL
112	3D	1.85	1.27	6560	<DL	33.2	<DL	<DL
112	3E	2.85	<DL	9000	<DL	26.8	<DL	<DL
112	3F	3.6	<DL	11000	<DL	45.5	<DL	<DL
112	4A	<DL	<DL	1980	<DL	17.5	<DL	<DL
112	4B	2.17	1.63	7140	<DL	42.4	<DL	<DL
112	4C	1.89	<DL	7160	<DL	39.3	<DL	<DL
112	4D	2	<DL	7610	<DL	50.8	<DL	<DL
112	4E	2.99	<DL	10200	<DL	47.5	<DL	<DL
112	4F	3.23	<DL	10600	<DL	55.6	<DL	<DL
112	5A	1.41	6.49	5370	<DL	23.1	<DL	<DL
112	5B	2.44	2.87	8150	<DL	38.2	<DL	<DL
112	5C	2.31	1.69	8320	<DL	50.6	<DL	<DL
112	5D	2.26	1.35	8410	<DL	52	<DL	<DL
112	5E	2.98	1.01	9980	<DL	46.6	<DL	<DL
112	5F	3.12	<DL	9940	<DL	43.7	<DL	<DL
112	6A	1.99	1.77	5340	<DL	12.6	<DL	<DL
112	6B	2.74	2.46	8090	<DL	33.8	<DL	<DL
112	6C	2.2	1	7270	<DL	38.9	<DL	<DL
112	6D	2.04	<DL	6890	<DL	31	<DL	<DL
112	6E	3.41	<DL	10500	<DL	33.6	<DL	<DL
112	6F	3.53	<DL	10900	<DL	46.4	<DL	<DL
112	BCAL	<DL	1.25	52.6	<DL	8.25	<DL	<DL
112	BDOL	<DL	1.03	<DL	<DL	118	<DL	<DL
112	R4	<DL	<DL	<DL	<DL	<DL	<DL	<DL
116	1A	<DL	2.47	2220	<DL	35.6	<DL	<DL
116	1B	1.84	2.77	5930	<DL	36.5	<DL	<DL
116	1C	2.06	1.61	7220	<DL	42.3	<DL	<DL
116	1D	2.05	<DL	7120	<DL	54.6	<DL	<DL
116	1E	3.07	<DL	10300	<DL	60.6	<DL	<DL
116	1F	3.28	<DL	10200	<DL	43.7	<DL	<DL
116	2A	<DL	1.59	3690	<DL	22.8	<DL	<DL
116	2B	2.08	2.99	7310	<DL	39.3	<DL	<DL
116	2C	2.04	<DL	7490	<DL	46.8	<DL	<DL
116	2D	1.85	<DL	6390	<DL	52.1	<DL	<DL
116	2E	3.04	<DL	10100	<DL	55.7	<DL	<DL
116	2F	<DL	<DL	851	<DL	31.5	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
116	3A	<DL	1.84	1080	<DL	12.5	<DL	<DL
116	3B	1.67	2.41	5660	<DL	22.7	<DL	<DL
116	3C	1.75	1.41	6520	<DL	36.3	<DL	<DL
116	3D	1.97	1.44	7150	<DL	37.8	<DL	<DL
116	3E	2.75	<DL	9000	<DL	27.1	<DL	<DL
116	3F	3.61	<DL	11400	<DL	48.6	<DL	<DL
116	4A	<DL	<DL	1460	<DL	13.6	<DL	<DL
116	4B	1.87	<DL	6900	<DL	35.9	<DL	<DL
116	4C	1.81	<DL	6960	<DL	39.6	<DL	<DL
116	4D	<DL	<DL	2280	<DL	44.3	<DL	<DL
116	4E	3.42	<DL	9810	<DL	48.2	<DL	<DL
116	4F	3.26	<DL	9560	<DL	53.4	<DL	<DL
116	5A	1.59	6.74	5120	<DL	22.2	<DL	<DL
116	5B	2.75	3.08	8500	<DL	39.4	<DL	<DL
116	5C	2.42	2.2	8190	<DL	48.9	<DL	<DL
116	5D	2.38	1.55	8260	<DL	48.8	<DL	<DL
116	5E	3.05	1.44	9920	<DL	47.5	<DL	<DL
116	5F	3.35	<DL	10300	<DL	44.6	<DL	<DL
116	6A	<DL	1.52	1210	<DL	11.5	<DL	<DL
116	6B	2.38	1.35	8110	<DL	32.3	<DL	<DL
116	6C	1.96	1.1	7320	<DL	37	<DL	<DL
116	6D	1.5	<DL	5580	<DL	29	<DL	<DL
116	6E	3.15	<DL	10200	<DL	32.4	<DL	<DL
116	6F	3.16	<DL	10400	<DL	42.7	<DL	<DL
116	BCAL	<DL	<DL	40.5	<DL	7.97	<DL	<DL
116	BDOL	<DL	<DL	<DL	<DL	118	<DL	<DL
116	R5	<DL	<DL	<DL	<DL	<DL	<DL	<DL
119	1A	1.02	1.14	2940	<DL	40.5	<DL	<DL
119	1B	1.79	2.01	5040	<DL	35.6	<DL	<DL
119	1C	2.09	<DL	6710	<DL	41.9	<DL	<DL
119	1D	1.9	<DL	6250	<DL	54.7	<DL	<DL
119	1E	3.02	<DL	9410	<DL	61.2	<DL	<DL
119	1F	3.29	<DL	9640	<DL	44.1	<DL	<DL
119	2A	<DL	1	3710	<DL	22.9	<DL	<DL
119	2B	1.91	2.32	6330	<DL	32.4	<DL	<DL
119	2C	2.02	<DL	6940	<DL	44.6	<DL	<DL
119	2D	2.11	<DL	6910	<DL	64.1	<DL	<DL
119	2E	2.93	<DL	9290	<DL	58.4	<DL	<DL
119	2F	3.16	<DL	9370	<DL	35.8	<DL	<DL
119	3A	<DL	<DL	2160	<DL	13.1	<DL	<DL
119	3B	1.97	1.38	5080	<DL	21.6	<DL	<DL
119	3C	1.99	<DL	5890	<DL	35.9	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
119	3D	2.1	<DL	6200	<DL	37.7	<DL	<DL
119	3E	3.09	<DL	8740	<DL	26.7	<DL	<DL
119	3F	3.65	<DL	10200	<DL	43.8	<DL	<DL
119	4A	<DL	1.11	1460	<DL	12	<DL	<DL
119	4B	1.87	<DL	5790	<DL	31.6	<DL	<DL
119	4C	1.91	<DL	6530	<DL	42	<DL	<DL
119	4D	1.94	<DL	6550	<DL	49.1	<DL	<DL
119	4E	2.71	<DL	8760	<DL	46.1	<DL	<DL
119	4F	3.07	<DL	9430	<DL	57.1	<DL	<DL
119	5A	1.12	3.47	3850	<DL	16.1	<DL	<DL
119	5B	2.41	2.61	7440	<DL	37.6	<DL	<DL
119	5C	2.18	1.64	7540	<DL	47.9	<DL	<DL
119	5D	2.16	1.15	7480	<DL	47.3	<DL	<DL
119	5E	2.96	<DL	9290	<DL	46.3	<DL	<DL
119	5F	3.12	<DL	9370	<DL	42	<DL	<DL
119	6A	1.16	1.59	3860	<DL	11.6	<DL	<DL
119	6B	2.15	1.01	7080	<DL	29.2	<DL	<DL
119	6C	1.82	<DL	6650	<DL	35.4	<DL	<DL
119	6D	1.76	<DL	6520	<DL	30.2	<DL	<DL
119	6E	2.96	<DL	9650	<DL	31.7	<DL	<DL
119	6F	3.12	<DL	9780	<DL	42	<DL	<DL
119	BCAL	<DL	<DL	38.2	<DL	7.51	<DL	<DL
119	BDOL	<DL	<DL	<DL	<DL	115	<DL	<DL
119	R6	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123	1A	1.05	2.75	3620	<DL	49.4	<DL	<DL
123	1B	1.74	1.99	5580	<DL	39.4	<DL	<DL
123	1C	1.82	<DL	6370	<DL	39.7	<DL	<DL
123	1D	2.74	<DL	7390	<DL	59.2	<DL	<DL
123	1E	3.41	<DL	9420	<DL	62.5	<DL	<DL
123	1F	3.59	<DL	9670	<DL	46.2	<DL	<DL
123	2A	1.34	2.28	4420	<DL	25.2	<DL	<DL
123	2B	2.24	2.99	6990	<DL	47.4	<DL	<DL
123	2C	2.1	1.35	6680	<DL	40.6	<DL	<DL
123	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
123	2E	3.13	1.19	9380	<DL	61.5	<DL	<DL
123	2F	3.34	<DL	9330	<DL	35.7	<DL	<DL
123	3A	<DL	1.45	2320	<DL	13.3	<DL	<DL
123	3B	1.7	1.55	5500	<DL	24.1	<DL	<DL
123	3C	1.82	<DL	6240	<DL	39.3	<DL	<DL
123	3D	1.86	<DL	6220	<DL	37.8	<DL	<DL
123	3E	2.78	<DL	8650	<DL	27.3	<DL	<DL
123	3F	3.41	<DL	10100	<DL	44.4	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
123	4A	<DL	<DL	1950	<DL	15.1	<DL	<DL
123	4B	1.87	<DL	6190	<DL	33.3	<DL	<DL
123	4C	1.74	<DL	6290	<DL	42	<DL	<DL
123	4D	1.85	<DL	6640	<DL	51.1	<DL	<DL
123	4E	2.84	<DL	9420	<DL	51.8	<DL	<DL
123	4F	2.96	<DL	9350	<DL	56.9	<DL	<DL
123	5A	1.03	3.57	3820	<DL	18.7	<DL	<DL
123	5B	2.45	3	7910	<DL	38.7	<DL	<DL
123	5C	2.17	<DL	7660	<DL	48	<DL	<DL
123	5D	2.08	<DL	7420	<DL	46.8	<DL	<DL
123	5E	2.72	<DL	8950	<DL	44.1	<DL	<DL
123	5F	2.86	<DL	9030	<DL	39.9	<DL	<DL
123	6A	1.09	1.7	3660	<DL	9.96	<DL	<DL
123	6B	2.18	<DL	7320	<DL	30.5	<DL	<DL
123	6C	1.88	<DL	6940	<DL	36.1	<DL	<DL
123	6D	1.76	<DL	6510	<DL	30.9	<DL	<DL
123	6E	3.11	<DL	10100	<DL	32.9	<DL	<DL
123	6F	2.97	<DL	9280	<DL	39.1	<DL	<DL
123	BCAL	<DL	<DL	39.1	<DL	6.95	<DL	<DL
123	BDOL	<DL	<DL	<DL	<DL	53.1	<DL	<DL
123	R1	<DL	<DL	<DL	<DL	<DL	<DL	<DL
126	1A	1.52	<DL	3840	<DL	68.1	<DL	<DL
126	1B	2.1	1.16	5190	<DL	43.2	<DL	<DL
126	1C	2.3	1.47	6120	<DL	48.8	<DL	<DL
126	1D	2.39	1.09	6620	<DL	67.7	<DL	<DL
126	1E	3.4	1.44	9360	<DL	79.3	<DL	<DL
126	1F	3.61	<DL	9520	<DL	54.5	<DL	<DL
126	2A	1.33	2.24	4160	<DL	24.7	<DL	<DL
126	2B	2.16	2.76	6450	<DL	44.3	<DL	<DL
126	2C	2.18	1.53	6700	<DL	50	<DL	<DL
126	2D	2.18	1.51	6560	<DL	67.1	<DL	<DL
126	2E	3.16	<DL	9190	<DL	78	<DL	<DL
126	2F	3.26	<DL	8920	<DL	41.8	<DL	<DL
126	3A	<DL	1.21	2320	<DL	13.2	<DL	<DL
126	3B	1.8	1.35	5500	<DL	26.2	<DL	<DL
126	3C	1.86	<DL	5990	<DL	45	<DL	<DL
126	3D	1.94	<DL	5970	<DL	44.4	<DL	<DL
126	3E	2.82	<DL	8250	<DL	31.6	<DL	<DL
126	3F	3.87	<DL	10800	<DL	57.7	<DL	<DL
126	4A	<DL	<DL	1850	<DL	15.3	<DL	<DL
126	4B	1.96	1.31	6130	<DL	37.2	<DL	<DL
126	4C	1.87	<DL	6420	<DL	55.5	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc μg/L 1	Se μg/L 1	Si μg/L 8	Sn μg/L 1	Sr μg/L 1	Ta μg/L 0.6	Th μg/L 2
126	4D	1.9	<DL	6520	<DL	59.9	<DL	<DL
126	4E	2.98	<DL	9250	<DL	64.7	<DL	<DL
126	4F	3.46	<DL	10500	<DL	79.1	<DL	<DL
126	5A	1.56	6.19	5220	<DL	24.8	<DL	<DL
126	5B	2.25	3.62	6900	<DL	44.5	<DL	<DL
126	5C	2.33	1.65	7640	<DL	60.1	<DL	<DL
126	5D	2.09	<DL	7110	<DL	54.7	<DL	<DL
126	5E	2.97	1.13	9320	<DL	55.7	<DL	<DL
126	5F	3.29	<DL	9560	<DL	49.4	<DL	<DL
126	6A	<DL	2.1	1720	<DL	14.5	<DL	48.9
126	6B	2.75	1.5	6960	<DL	33.6	<DL	<DL
126	6C	2.4	<DL	7010	<DL	43.5	<DL	<DL
126	6D	2.23	1.18	6680	<DL	37.1	<DL	<DL
126	6E	3.35	<DL	9390	<DL	37.3	<DL	<DL
126	6F	3.37	<DL	9560	<DL	46.6	<DL	<DL
126	BCAL	<DL	<DL	39.7	<DL	6.17	<DL	<DL
126	BDOL	<DL	<DL	<DL	<DL	108	<DL	<DL
126	R2	<DL	<DL	<DL	<DL	<DL	<DL	<DL
130	1A	1.13	3.39	3540	<DL	58.8	<DL	<DL
130	1B	1.99	2.41	5970	<DL	52.9	<DL	<DL
130	1C	2.11	1.32	6620	<DL	52.1	<DL	<DL
130	1D	<DL	1.11	1690	<DL	51.6	<DL	<DL
130	1E	3.13	<DL	9520	<DL	84.1	<DL	<DL
130	1F	1	<DL	1930	<DL	33.4	<DL	<DL
130	2A	1.23	2.21	4010	<DL	43.1	<DL	<DL
130	2B	2.31	2.81	6770	<DL	113	<DL	<DL
130	2C	2.32	<DL	6970	<DL	58.5	<DL	<DL
130	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
130	2E	3.27	1.11	9340	<DL	80.6	<DL	<DL
130	2F	3.34	<DL	9360	<DL	42.8	<DL	<DL
130	3A	<DL	1.96	2190	<DL	17.9	<DL	<DL
130	3B	1.78	1.63	5520	<DL	28	<DL	<DL
130	3C	1.83	<DL	6030	<DL	48.8	<DL	<DL
130	3D	1.15	2.15	3480	<DL	45.2	<DL	<DL
130	3E	2.8	1.22	8400	<DL	33.4	<DL	<DL
130	3F	1.3	<DL	3070	<DL	33	<DL	<DL
130	4A	<DL	<DL	1470	<DL	18.9	<DL	<DL
130	4B	2.03	1.05	6520	<DL	39.9	<DL	<DL
130	4C	1.86	<DL	6440	<DL	51.9	<DL	<DL
130	4D	1.29	<DL	3120	<DL	53	<DL	<DL
130	4E	3.31	<DL	8790	<DL	63.7	<DL	<DL
130	4F	<DL	<DL	1350	<DL	27.8	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
130	5A	1.39	4.98	3810	<DL	24.8	<DL	<DL
130	5B	2.77	3	7380	<DL	42.9	<DL	<DL
130	5C	2.62	2.39	7540	<DL	60.1	<DL	<DL
130	5D	1.77	1.1	5260	<DL	50.7	<DL	<DL
130	5E	3.07	1.7	8930	<DL	53.7	<DL	<DL
130	5F	1.05	1.01	1850	<DL	33.6	<DL	<DL
130	6A	<DL	3.27	504	<DL	9.76	<DL	<DL
130	6B	2.46	2.03	7320	<DL	34.3	<DL	<DL
130	6C	2.15	1.15	7070	<DL	41.8	<DL	<DL
130	6D	<DL	<DL	2920	<DL	32.3	<DL	<DL
130	6E	3.23	<DL	9690	<DL	37.7	<DL	<DL
130	6F	<DL	<DL	1300	<DL	31.4	<DL	<DL
130	BCAL	<DL	1.12	9.56	<DL	3.39	<DL	<DL
130	BDOL	<DL	1.09	<DL	<DL	114	<DL	<DL
130	R3	<DL	<DL	<DL	<DL	<DL	<DL	<DL
133	1A	1.24	1.78	3470	<DL	62.4	<DL	<DL
133	1B	1.81	1.48	4950	<DL	44.2	<DL	<DL
133	1C	1.97	1.02	6000	<DL	52.2	<DL	<DL
133	1D	2.05	<DL	6390	<DL	70.6	<DL	<DL
133	1E	2.86	<DL	8400	<DL	76.4	<DL	<DL
133	1F	3.12	<DL	8850	<DL	51.4	<DL	<DL
133	2A	1.16	1.67	3970	<DL	32.1	<DL	<DL
133	2B	1.8	2.44	5560	<DL	71.3	<DL	<DL
133	2C	2.02	1.25	6250	<DL	62.8	<DL	<DL
133	2D	2.3	2.17	6940	<DL	74.4	<DL	<DL
133	2E	2.86	<DL	8530	<DL	80.9	<DL	<DL
133	2F	2.97	<DL	8390	<DL	40.5	<DL	<DL
133	3A	<DL	<DL	2240	<DL	13.2	<DL	<DL
133	3B	2.05	1.7	5050	<DL	27.3	<DL	<DL
133	3C	1.97	1.21	5540	<DL	46.1	<DL	<DL
133	3D	2.03	2.21	5730	<DL	46	<DL	<DL
133	3E	2.89	<DL	7860	<DL	32.7	<DL	<DL
133	3F	3.55	<DL	9380	<DL	51.7	<DL	<DL
133	4A	<DL	<DL	2280	<DL	19.1	<DL	<DL
133	4B	1.85	<DL	5510	<DL	32.1	<DL	<DL
133	4C	1.78	<DL	5900	<DL	48.3	<DL	<DL
133	4D	1.87	<DL	6150	<DL	55.1	<DL	<DL
133	4E	2.76	<DL	8490	<DL	61.7	<DL	<DL
133	4F	2.9	<DL	8600	<DL	71.9	<DL	<DL
133	5A	1.36	5.43	4530	<DL	23.7	<DL	<DL
133	5B	2.2	2.19	6490	<DL	35.3	<DL	<DL
133	5C	2.16	1.16	7030	<DL	54.1	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
133	5D	2.02	1.38	6800	<DL	52.5	<DL	<DL
133	5E	2.75	<DL	8430	<DL	52.1	<DL	<DL
133	5F	2.77	<DL	8210	<DL	43.1	<DL	<DL
133	6A	1.02	1.95	3200	<DL	10.4	<DL	<DL
133	6B	1.99	1.34	6260	<DL	29.4	<DL	<DL
133	6C	1.77	<DL	6060	<DL	36.9	<DL	<DL
133	6D	1.75	<DL	6090	<DL	34	<DL	<DL
133	6E	2.83	<DL	8770	<DL	34	<DL	<DL
133	6F	2.84	<DL	8710	<DL	41.8	<DL	<DL
133	BCAL	<DL	<DL	33.4	<DL	5.98	<DL	<DL
133	BDOL	<DL	<DL	<DL	<DL	132	<DL	<DL
133	R4	<DL	<DL	<DL	<DL	<DL	<DL	<DL
138	1A	1.31	2.56	4420	<DL	79	<DL	<DL
138	1B	1.72	2.15	5430	<DL	49.4	<DL	<DL
138	1C	1.77	<DL	5930	<DL	51.9	<DL	<DL
138	1D	2.33	<DL	6020	<DL	70.4	<DL	<DL
138	1E	3.14	1.14	8520	<DL	81.5	<DL	<DL
138	1F	3.38	<DL	8860	<DL	52.1	<DL	<DL
138	2A	1.35	1.21	4240	<DL	35.3	<DL	<DL
138	2B	1.8	2.79	5250	<DL	50.8	<DL	<DL
138	2C	2.02	1.57	6130	<DL	61.6	<DL	<DL
138	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
138	2E	2.87	1.18	8260	<DL	83.9	<DL	<DL
138	2F	3.12	<DL	8460	<DL	42	<DL	<DL
138	3A	<DL	<DL	2370	<DL	13.1	<DL	<DL
138	3B	1.78	1.11	5420	<DL	32.1	<DL	<DL
138	3C	1.62	<DL	5300	<DL	49.9	<DL	<DL
138	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
138	3E	2.59	<DL	7870	<DL	36.9	<DL	<DL
138	3F	3.54	<DL	9950	<DL	60.4	<DL	<DL
138	4A	<DL	<DL	2430	<DL	21	<DL	<DL
138	4B	1.85	<DL	5860	<DL	35.3	<DL	<DL
138	4C	1.74	<DL	5920	<DL	51.4	<DL	<DL
138	4D	1.64	<DL	5700	<DL	51.4	<DL	<DL
138	4E	2.59	<DL	8310	<DL	65.8	<DL	<DL
138	4F	2.79	<DL	8500	<DL	72.4	<DL	<DL
138	5A	<DL	1.82	2280	<DL	12.5	<DL	<DL
138	5B	2.28	1.76	7240	<DL	39.6	<DL	<DL
138	5C	2.02	<DL	7050	<DL	53	<DL	<DL
138	5D	2.02	<DL	7010	<DL	53.2	<DL	<DL
138	5E	2.57	<DL	8230	<DL	50.8	<DL	<DL
138	5F	2.6	<DL	7880	<DL	44.5	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
138	6A	<DL	1.43	3110	<DL	16.2	<DL	<DL
138	6B	2.03	<DL	6580	<DL	36.7	<DL	<DL
138	6C	1.74	<DL	6310	<DL	38	<DL	<DL
138	6D	1.65	<DL	5720	<DL	33.5	<DL	<DL
138	6E	2.59	<DL	8310	<DL	33.5	<DL	<DL
138	6F	2.79	<DL	8560	<DL	41.1	<DL	<DL
138	BCAL	<DL	<DL	32.5	<DL	6.1	<DL	<DL
138	BDOL	<DL	<DL	<DL	<DL	57.7	<DL	<DL
138	R5	<DL	<DL	<DL	<DL	<DL	<DL	<DL
140	1A	1.85	<DL	4430	<DL	61.6	<DL	3.19
140	1B	2.21	<DL	5310	<DL	35.6	<DL	2.14
140	1C	2.32	<DL	6280	<DL	44	<DL	2.14
140	1D	2.47	<DL	6660	<DL	55.4	<DL	2.15
140	1E	3.31	1.17	9060	<DL	63.6	<DL	2.08
140	1F	3.73	<DL	9710	<DL	42.1	<DL	2.07
140	2A	1.39	2	4100	<DL	24.7	<DL	2.03
140	2B	2.02	2.18	5570	<DL	35.5	<DL	2.06
140	2C	2.35	<DL	6790	<DL	48.2	<DL	<DL
140	2D	2.67	1.54	7680	<DL	71.4	<DL	<DL
140	2E	3.58	<DL	9240	<DL	73.4	<DL	<DL
140	2F	3.63	<DL	9270	<DL	37.6	<DL	<DL
140	3A	<DL	1.92	2330	<DL	12.5	<DL	<DL
140	3B	1.73	1.29	5160	<DL	22.1	<DL	<DL
140	3C	1.88	1.21	5820	<DL	40.2	<DL	<DL
140	3D	1.99	1.1	6290	<DL	40.7	<DL	<DL
140	3E	3.02	<DL	8860	<DL	32.6	<DL	<DL
140	3F	3.99	<DL	10800	<DL	49.1	<DL	<DL
140	4A	<DL	<DL	1700	<DL	12.3	<DL	<DL
140	4B	1.85	<DL	5990	<DL	27.2	<DL	<DL
140	4C	1.84	<DL	6440	<DL	41.8	<DL	<DL
140	4D	1.88	<DL	6650	<DL	42.4	<DL	<DL
140	4E	2.68	<DL	8840	<DL	51.5	<DL	<DL
140	4F	3.08	<DL	9550	<DL	61.3	<DL	<DL
140	5A	<DL	2.23	2640	<DL	11.1	<DL	<DL
140	5B	2.11	2.41	6840	<DL	26	<DL	<DL
140	5C	2.2	1.18	7770	<DL	44.6	<DL	<DL
140	5D	2.12	1.21	7620	<DL	44.8	<DL	<DL
140	5E	2.75	<DL	8870	<DL	42.6	<DL	<DL
140	5F	3.04	<DL	9430	<DL	38.4	<DL	<DL
140	6A	1.13	2.12	3080	<DL	8.19	<DL	<DL
140	6B	2.52	2.1	6890	<DL	31.4	<DL	<DL
140	6C	2.37	<DL	7250	<DL	36	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
140	6D	2.09	<DL	6870	<DL	31.4	<DL	<DL
140	6E	3.3	<DL	9870	<DL	30	<DL	<DL
140	6F	3.47	<DL	10100	<DL	35.3	<DL	<DL
140	BCAL	<DL	<DL	60.1	<DL	7.07	<DL	<DL
140	BDOL	<DL	<DL	19.9	<DL	83.8	<DL	<DL
140	R6	<DL	1.06	18.7	<DL	<DL	<DL	<DL
144	1A	1.52	2.97	5330	<DL	75	<DL	<DL
144	1B	1.85	2.64	5700	<DL	39.6	<DL	<DL
144	1C	2.19	1.75	7380	<DL	51.6	<DL	<DL
144	1D	2.08	1.3	7120	<DL	59.8	<DL	<DL
144	1E	3.13	<DL	9900	<DL	73.1	<DL	<DL
144	1F	3.46	<DL	10200	<DL	44.5	<DL	<DL
144	2A	1.16	2.07	4400	<DL	27.2	<DL	<DL
144	2B	1.96	2.9	6470	<DL	40	<DL	<DL
144	2C	2.1	1.7	7210	<DL	48.7	<DL	<DL
144	2D	2.04	2.26	7090	<DL	64.2	<DL	<DL
144	2E	3.17	1.15	9990	<DL	79.7	<DL	<DL
144	2F	3.08	<DL	9080	<DL	35.7	<DL	<DL
144	3A	<DL	1.88	2860	<DL	14.2	<DL	<DL
144	3B	1.8	1.67	5960	<DL	25.5	<DL	<DL
144	3C	1.71	1.17	6220	<DL	42.1	<DL	<DL
144	3D	1.49	<DL	5400	<DL	34.1	<DL	<DL
144	3E	2.85	<DL	9190	<DL	38.3	<DL	<DL
144	3F	3.72	<DL	11100	<DL	53.1	<DL	<DL
144	4A	<DL	1.36	3280	<DL	22.3	<DL	<DL
144	4B	1.77	1.3	6290	<DL	27.5	<DL	<DL
144	4C	1.68	<DL	6440	<DL	40.5	<DL	<DL
144	4D	2.42	<DL	6880	<DL	43.5	<DL	<DL
144	4E	3.33	<DL	9600	<DL	56.4	<DL	<DL
144	4F	3.37	<DL	9510	<DL	64.4	<DL	<DL
144	5A	<DL	2.73	2280	<DL	9.87	<DL	<DL
144	5B	2.4	2.77	7240	<DL	26.2	<DL	<DL
144	5C	2.35	1.72	7920	<DL	43.3	<DL	<DL
144	5D	2.36	1.2	8110	<DL	44.4	<DL	<DL
144	5E	2.99	<DL	9470	<DL	45.3	<DL	<DL
144	5F	3.11	<DL	9380	<DL	39.2	<DL	<DL
144	6A	<DL	1.44	2840	<DL	8.09	<DL	<DL
144	6B	2.08	<DL	6960	<DL	29.2	<DL	<DL
144	6C	1.98	<DL	7220	<DL	34.5	<DL	<DL
144	6D	1.92	<DL	6930	<DL	31.5	<DL	<DL
144	6E	3.02	<DL	9940	<DL	29.4	<DL	<DL
144	6F	3.03	<DL	9510	<DL	32.4	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
144	BCAL	<DL	<DL	49.2	<DL	5.71	<DL	<DL
144	BDOL	<DL	<DL	20.9	<DL	58.2	<DL	<DL
144	R1	<DL	1.42	25.7	<DL	<DL	<DL	<DL
147	1A	1.99	1.3	5770	<DL	81.7	<DL	<DL
147	1B	2.21	1.5	6360	<DL	49.6	<DL	<DL
147	1C	2.23	<DL	7130	<DL	46.8	<DL	<DL
147	1D	2.69	1.72	8650	<DL	70.3	<DL	<DL
147	1E	3.21	<DL	10200	<DL	71.8	<DL	<DL
147	1F	3.52	<DL	10600	<DL	47.2	<DL	<DL
147	2A	1.32	2.17	4650	<DL	25.8	<DL	<DL
147	2B	2.01	2.36	6580	<DL	33.9	<DL	<DL
147	2C	2.22	1.18	7390	<DL	45.2	<DL	<DL
147	2D	2.78	2.53	8900	<DL	73.7	<DL	<DL
147	2E	3.23	<DL	10100	<DL	80.5	<DL	<DL
147	2F	3.62	<DL	10900	<DL	39.6	<DL	<DL
147	3A	1.2	<DL	3140	<DL	13.8	<DL	<DL
147	3B	2.2	<DL	5820	<DL	23.2	<DL	<DL
147	3C	2.09	<DL	6340	<DL	36.4	<DL	<DL
147	3D	2.06	<DL	6260	<DL	37	<DL	<DL
147	3E	3.3	<DL	9450	<DL	38.5	<DL	<DL
147	3F	4.6	<DL	13300	<DL	58.2	<DL	<DL
147	4A	1.12	<DL	3650	<DL	21.8	<DL	<DL
147	4B	2.05	<DL	6500	<DL	25.3	<DL	<DL
147	4C	2.04	<DL	7050	<DL	39	<DL	<DL
147	4D	2.07	<DL	7260	<DL	40.2	<DL	<DL
147	4E	3.14	<DL	10200	<DL	56.1	<DL	<DL
147	4F	3.16	<DL	10000	<DL	65.8	<DL	<DL
147	5A	<DL	2.14	3220	<DL	12.8	<DL	<DL
147	5B	2.25	2.12	7170	<DL	22.6	<DL	<DL
147	5C	2.36	<DL	8320	<DL	40.1	<DL	<DL
147	5D	2.36	<DL	8400	<DL	41.7	<DL	<DL
147	5E	2.85	<DL	9550	<DL	43.2	<DL	<DL
147	5F	3.17	<DL	10000	<DL	40.3	<DL	<DL
147	6A	<DL	<DL	3220	<DL	8.74	<DL	<DL
147	6B	2.11	1.03	7130	<DL	26.4	<DL	<DL
147	6C	2.1	<DL	7770	<DL	34.6	<DL	<DL
147	6D	1.91	<DL	7190	<DL	30.1	<DL	<DL
147	6E	2.94	<DL	10100	<DL	28.1	<DL	<DL
147	6F	3.16	<DL	10100	<DL	32.1	<DL	<DL
147	BCAL	<DL	<DL	35.4	<DL	6.19	<DL	<DL
147	BDOL	<DL	<DL	<DL	<DL	73.3	<DL	<DL
147	R2	<DL	<DL	<DL	<DL	<DL	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
151	1A	1.74	2.48	6100	<DL	92.5	<DL	<DL
151	1B	2.1	2.37	6930	<DL	53.2	<DL	<DL
151	1C	1.91	<DL	6850	<DL	47.3	<DL	<DL
151	1D	2.68	<DL	7440	<DL	58.6	<DL	<DL
151	1E	4.08	1.22	11500	<DL	83.4	<DL	<DL
151	1F	3.65	<DL	10300	<DL	45.6	<DL	<DL
151	2A	1.32	<DL	4370	<DL	22.4	<DL	<DL
151	2B	2.08	1.91	6460	<DL	31.2	<DL	<DL
151	2C	2.22	1.3	7130	<DL	43.1	<DL	<DL
151	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
151	2E	3.17	<DL	9860	<DL	71.4	<DL	<DL
151	2F	3.17	<DL	9530	<DL	39.5	<DL	<DL
151	3A	1.15	1.89	3950	<DL	18.1	<DL	<DL
151	3B	2.13	1.33	6820	<DL	26.9	<DL	<DL
151	3C	1.74	<DL	6140	<DL	36.8	<DL	<DL
151	3D	1.76	<DL	6230	<DL	36.1	<DL	<DL
151	3E	2.94	<DL	9440	<DL	40.7	<DL	<DL
151	3F	3.67	<DL	11300	<DL	50.3	<DL	<DL
151	4A	<DL	<DL	1920	<DL	10.1	<DL	<DL
151	4B	1.92	<DL	6550	<DL	26.4	<DL	<DL
151	4C	2.06	<DL	7760	<DL	45.4	<DL	<DL
151	4D	1.89	<DL	7080	<DL	39.2	<DL	<DL
151	4E	2.68	<DL	9400	<DL	54.2	<DL	<DL
151	4F	2.92	<DL	9790	<DL	62.5	<DL	<DL
151	5A	<DL	2.26	2780	<DL	10.5	<DL	<DL
151	5B	2.29	2.15	7510	<DL	23.1	<DL	<DL
151	5C	2.15	<DL	7930	<DL	37	<DL	<DL
151	5D	2.23	<DL	8450	<DL	40.7	<DL	<DL
151	5E	2.73	<DL	9450	<DL	43.7	<DL	<DL
151	5F	2.96	<DL	9630	<DL	38.9	<DL	<DL
151	6A	1.09	1.49	3650	<DL	7.3	<DL	<DL
151	6B	1.97	<DL	6970	<DL	24.8	<DL	<DL
151	6C	1.92	<DL	7370	<DL	31.7	<DL	<DL
151	6D	1.84	<DL	7070	<DL	28.8	<DL	<DL
151	6E	2.86	<DL	10100	<DL	27.6	<DL	<DL
151	6F	2.88	<DL	9940	<DL	31.5	<DL	<DL
151	BCAL	<DL	<DL	30.7	<DL	5.87	<DL	<DL
151	BDOL	<DL	<DL	<DL	<DL	66.9	<DL	<DL
151	R3	<DL	<DL	27.7	<DL	<DL	<DL	<DL
154	1A	<DL	<DL	2470	<DL	49.5	<DL	<DL
154	1B	2.24	1.28	5730	<DL	48.2	<DL	<DL
154	1C	2.16	<DL	6150	<DL	54.9	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
		Element, Unit, Detection Limit						
154	1D	1.52	<DL	4200	<DL	60.8	<DL	<DL
154	1E	3.04	<DL	8950	<DL	76.3	<DL	<DL
154	1F	2.69	<DL	7340	<DL	38.9	<DL	<DL
154	2A	1.23	2.08	4020	<DL	30.8	<DL	<DL
154	2B	1.95	2.22	6120	<DL	35.5	<DL	<DL
154	2C	1.97	1.07	6300	<DL	41	<DL	<DL
154	2D	2.14	1.45	6710	<DL	61.6	<DL	<DL
154	2E	3.1	1.19	9360	<DL	89.9	<DL	<DL
154	2F	1.01	<DL	1970	<DL	27.8	<DL	<DL
154	3A	<DL	2.19	1480	<DL	16.7	<DL	<DL
154	3B	1.73	1.34	5440	<DL	24.3	<DL	<DL
154	3C	1.62	<DL	5610	<DL	37	<DL	<DL
154	3D	<DL	<DL	2910	<DL	34.2	<DL	<DL
154	3E	2.83	<DL	8720	<DL	44.8	<DL	<DL
154	3F	2.32	<DL	6670	<DL	35.3	<DL	<DL
154	4A	<DL	<DL	2100	<DL	11.6	<DL	<DL
154	4B	1.7	<DL	5630	<DL	26.1	<DL	<DL
154	4C	1.69	<DL	6120	<DL	38.4	<DL	<DL
154	4D	<DL	<DL	2250	<DL	36.8	<DL	<DL
154	4E	2.72	<DL	8880	<DL	59.4	<DL	<DL
154	4F	<DL	<DL	1380	<DL	38.4	<DL	<DL
154	5A	<DL	<DL	1620	<DL	10.7	<DL	<DL
154	5B	2.37	1.73	5790	<DL	23.4	<DL	<DL
154	5C	2.36	<DL	6560	<DL	42.1	<DL	<DL
154	5D	1.7	1.47	4890	<DL	44.6	<DL	<DL
154	5E	2.83	<DL	7920	<DL	52.8	<DL	<DL
154	5F	2.81	<DL	7670	<DL	45.6	<DL	<DL
154	6A	<DL	1.22	350	<DL	5.19	<DL	<DL
154	6B	2.12	1.89	6070	<DL	29.4	<DL	<DL
154	6C	1.95	<DL	6220	<DL	37.2	<DL	<DL
154	6D	<DL	1.26	2340	<DL	33.7	<DL	<DL
154	6E	2.72	<DL	8280	<DL	31.7	<DL	<DL
154	6F	<DL	<DL	357	<DL	31.8	<DL	<DL
154	BCAL	<DL	1.19	10.7	<DL	4.6	<DL	<DL
154	BDOL	<DL	<DL	<DL	<DL	75.3	<DL	<DL
154	R4	<DL	<DL	<DL	<DL	<DL	<DL	<DL
172	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	1B	n.d.	3.81	5520	n.d.	40.8	n.d.	n.d.
172	1C	2.18	1.74	6140	<DL	53.7	<DL	<DL
172	1D	2.38	2.02	6930	<DL	65.2	<DL	<DL
172	1E	2.78	1.47	8310	<DL	76.6	<DL	<DL
172	1F	1.88	<DL	4430	<DL	35.7	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Sc µg/L 1	Se µg/L 1	Si µg/L 8	Sn µg/L 1	Sr µg/L 1	Ta µg/L 0.6	Th µg/L 2
172	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2E	2.49	1.53	7810	<DL	85.2	<DL	<DL
172	2F	1.71	1.03	4040	<DL	29.6	<DL	<DL
172	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	3B	2.16	2.63	6980	<DL	55.3	<DL	<DL
172	3C	1.81	1.49	6200	<DL	51.5	<DL	<DL
172	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	3E	2.895	n.d.	8715	n.d.	49.5	n.d.	n.d.
172	3F	1.86	<DL	4630	<DL	31.6	<DL	<DL
172	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	4B	1.98	1.33	6560	<DL	35	<DL	<DL
172	4C	1.65	<DL	5990	<DL	36.9	<DL	<DL
172	4D	1.56	n.d.	5310	n.d.	38.7	n.d.	n.d.
172	4E	2.49	<DL	8290	<DL	63.3	<DL	<DL
172	4F	1.6	<DL	4270	<DL	45.6	<DL	<DL
172	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	5B	2.4675	5.2325	8452.5	n.d.	55.65	n.d.	n.d.
172	5C	1.97	2.3	6900	<DL	37.8	<DL	<DL
172	5D	1.68	1.29	5660	<DL	39	<DL	<DL
172	5E	2.39	1.21	7810	<DL	47.7	<DL	<DL
172	5F	1.48	<DL	3840	<DL	31	<DL	<DL
172	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	BCAL	<DL	1.01	38.9	<DL	8.19	<DL	<DL
172	BDOL	<DL	<DL	<DL	<DL	170	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
0	1A	10.1	<DL	4.41	0.417	4030	1.99	<DL
0	1B	7.86	<DL	2.4	0.766	312	1.31	<DL
0	1C	1.77	<DL	0.759	0.185	145	0.513	<DL
0	1D	1.88	<DL	0.686	0.253	861	0.348	<DL
0	1E	2.29	<DL	<DL	0.659	76	0.274	<DL
0	1F	2.78	<DL	0.467	1.35	1380	0.512	<DL
0	2A	10.7	<DL	3.49	0.31	5370	1.86	<DL
0	2B	11.2	<DL	2.7	0.991	184	1.99	0.0475
0	2C	2	<DL	0.969	0.191	164	0.301	0.076
0	2D	2.8	<DL	1.26	0.323	6740	0.411	0.105
0	2E	2.35	<DL	0.558	0.632	60.1	0.281	<DL
0	2F	2.67	<DL	0.634	1.12	384	0.567	<DL
0	3A	12.7	<DL	3.3	0.376	4100	3.15	<DL
0	3B	4.44	<DL	1.57	0.343	198	0.666	0.076
0	3C	1.61	<DL	0.838	0.123	176	0.199	<DL
0	3D	2.76	<DL	0.82	0.678	5000	0.377	<DL
0	3E	2.36	<DL	1.42	0.607	68.2	0.289	2.53
0	3F	3.14	<DL	0.832	1.14	3620	0.589	<DL
0	4A	1.74	<DL	0.56	<DL	689	0.301	<DL
0	4B	2.04	<DL	0.996	0.152	205	0.273	<DL
0	4C	1.44	<DL	0.607	0.104	193	0.153	<DL
0	4D	1.6	<DL	0.551	0.136	667	0.176	<DL
0	4E	2.44	<DL	0.566	0.757	52.1	0.314	<DL
0	4F	2.74	<DL	0.625	1.31	804	0.783	<DL
0	5A	2.57	<DL	1.03	0.0674	282	0.55	0.0475
0	5B	3.41	<DL	1.24	0.254	179	0.567	<DL
0	5C	1.41	<DL	0.712	0.0908	193	0.133	<DL
0	5D	1.56	<DL	0.591	0.112	1230	0.149	<DL
0	5E	2.31	<DL	0.441	0.681	53	0.295	<DL
0	5F	3.08	<DL	0.606	1.25	667	0.552	<DL
0	6A	5.62	<DL	1.02	0.685	575	1.16	<DL
0	6B	3.12	<DL	1.15	0.237	189	0.531	0.0475
0	6C	1.49	<DL	0.526	0.118	186	0.144	<DL
0	6D	2.14	<DL	0.766	0.233	16400	0.238	0.219
0	6E	2.39	<DL	0.632	0.722	75.6	0.317	<DL
0	6F	2.65	<DL	0.629	1.27	768	0.536	<DL
0	BCAL	<DL	<DL	<DL	<DL	1540	0.558	n.d.
0	BDOL	<DL	<DL	<DL	<DL	536	<DL	n.d.
0	R1	<DL	<DL	<DL	<DL	127	0.184	<DL
4	1A	17	<DL	4.75	0.478	2970	3.19	<DL

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
4	1B	8.91	<DL	2.08	0.906	211	1.81	<DL
4	1C	1.74	<DL	0.924	0.216	138	0.327	0.038
4	1D	2.06	<DL	0.785	0.304	498	0.346	<DL
4	1E	2.25	<DL	<DL	0.829	55.3	0.277	<DL
4	1F	2.61	<DL	0.498	1.45	1160	0.52	<DL
4	2A	19.7	<DL	3.1	0.451	119	2.81	<DL
4	2B	9.34	<DL	2.26	0.962	240	1.67	<DL
4	2C	1.92	<DL	1.03	0.195	160	0.298	<DL
4	2D	1.96	<DL	0.729	0.207	457	0.276	<DL
4	2E	2.24	<DL	0.581	0.733	52.1	0.285	<DL
4	2F	2.53	<DL	0.522	1.13	120	0.684	<DL
4	3A	11.5	<DL	2.65	0.359	1500	2.18	<DL
4	3B	4.42	<DL	1.61	0.412	219	0.778	<DL
4	3C	1.64	<DL	0.806	0.145	174	0.201	0.152
4	3D	1.96	<DL	0.769	0.322	599	0.255	<DL
4	3E	2.57	<DL	0.524	0.643	6520	0.294	<DL
4	3F	2.63	<DL	0.685	1.04	1240	0.716	<DL
4	4A	4.96	<DL	2.32	0.191	4610	0.887	<DL
4	4B	2.04	<DL	1.06	0.164	207	0.3	<DL
4	4C	1.43	<DL	0.598	0.116	220	0.147	<DL
4	4D	1.73	<DL	0.596	0.153	287	0.169	<DL
4	4E	2.29	<DL	0.523	0.766	52.2	0.336	<DL
4	4F	2.58	<DL	0.597	1.22	288	0.597	<DL
4	5A	16	<DL	3.18	0.541	862	2.24	<DL
4	5B	3.79	<DL	1.26	0.317	202	0.651	<DL
4	5C	1.41	<DL	0.708	0.105	192	0.125	0.095
4	5D	1.48	<DL	0.579	0.11	380	0.129	<DL
4	5E	2.2	<DL	<DL	0.742	50.2	0.299	<DL
4	5F	2.51	<DL	0.509	1.22	323	0.592	<DL
4	6A	6.79	<DL	1.58	0.28	123	1.18	<DL
4	6B	3.17	<DL	1.22	0.274	231	0.595	<DL
4	6C	1.42	<DL	0.526	0.112	195	0.131	<DL
4	6D	1.67	<DL	0.643	0.117	2940	0.174	<DL
4	6E	2.22	<DL	0.585	0.76	66.1	0.303	<DL
4	6F	2.56	<DL	0.605	1.18	149	0.549	<DL
4	BCAL	<DL	<DL	<DL	<DL	71.9	<DL	n.d.
4	BDOL	<DL	<DL	<DL	<DL	159	<DL	n.d.
4	R3	<DL	<DL	<DL	<DL	241	<DL	<DL
7	1A	9.53	<DL	3.16	0.246	1000	2	<DL
7	1B	9.48	<DL	2.15	0.992	208	1.75	<DL
7	1C	1.72	<DL	0.897	0.219	129	0.326	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
7	1D	1.85	<DL	0.92	0.263	724	0.343	<DL
7	1E	2.13	<DL	<DL	0.68	54.2	0.274	<DL
7	1F	2.36	<DL	0.477	1.18	2250	0.502	<DL
7	2A	7.47	<DL	2.12	0.256	2250	0.981	<DL
7	2B	8.98	<DL	2.33	0.939	230	1.58	<DL
7	2C	2	<DL	1.11	0.203	169	0.288	<DL
7	2D	1.79	<DL	0.757	0.223	390	0.271	<DL
7	2E	2.05	<DL	0.51	0.654	40	0.234	<DL
7	2F	2.73	<DL	0.682	1.35	399	0.661	<DL
7	3A	11.8	<DL	2.93	0.477	4130	2.2	<DL
7	3B	4.13	<DL	1.61	0.466	273	0.747	<DL
7	3C	1.66	<DL	0.857	0.109	131	0.166	<DL
7	3D	2.03	<DL	0.973	0.243	1990	0.246	<DL
7	3E	2.46	<DL	0.645	0.792	72	0.326	<DL
7	3F	2.48	<DL	0.65	1.08	2060	0.585	<DL
7	4A	2.94	<DL	1.63	0.0952	3930	0.656	<DL
7	4B	2.09	<DL	1.05	0.159	220	0.344	<DL
7	4C	1.39	<DL	0.663	0.097	183	0.121	<DL
7	4D	1.48	<DL	0.575	0.144	369	0.154	<DL
7	4E	2.16	<DL	0.52	0.801	42.7	0.293	<DL
7	4F	2.46	<DL	0.596	1.33	547	0.611	<DL
7	5A	7.91	<DL	1.78	0.245	1890	0.91	<DL
7	5B	4.25	<DL	1.17	0.434	186	0.759	<DL
7	5C	1.29	<DL	0.78	0.101	198	0.121	<DL
7	5D	1.59	<DL	0.672	0.0972	525	0.131	<DL
7	5E	2.17	<DL	<DL	0.623	48.4	0.292	<DL
7	5F	2.64	<DL	<DL	1.16	401	0.598	<DL
7	6A	4.06	<DL	0.808	0.254	230	0.666	<DL
7	6B	3.89	<DL	1.45	0.366	245	0.755	<DL
7	6C	1.55	<DL	0.536	0.0916	193	0.137	<DL
7	6D	1.89	<DL	0.798	0.167	2440	0.175	<DL
7	6E	2.4	<DL	0.666	0.709	49.9	0.331	<DL
7	6F	2.61	<DL	0.63	1.08	313	0.598	<DL
7	BCAL	<DL	<DL	<DL	<DL	141	<DL	n.d.
7	BDOL	<DL	<DL	<DL	<DL	463	<DL	n.d.
7	R4	<DL	<DL	<DL	<DL	182	<DL	<DL
11	1A	11.8	<DL	3.29	0.283	1260	2.13	<DL
11	1B	9.91	<DL	1.93	0.973	209	1.88	<DL
11	1C	2.05	<DL	0.981	0.207	121	0.371	<DL
11	1D	1.97	<DL	0.877	0.22	926	0.344	<DL
11	1E	2.34	<DL	0.434	0.605	49.8	0.278	<DL
11	1F	2.47	<DL	0.544	1.05	3270	0.526	<DL

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
11	2A	9.74	<DL	2.63	0.35	2140	1.39	<DL
11	2B	10.8	<DL	2.47	0.959	157	1.89	<DL
11	2C	2.15	<DL	1.3	0.205	175	0.336	<DL
11	2D	2.15	<DL	0.902	0.268	2150	0.335	<DL
11	2E	2.09	<DL	0.565	0.658	40.7	0.237	<DL
11	2F	2.37	<DL	0.554	1.01	238	0.558	<DL
11	3A	17.5	<DL	3.34	0.757	6400	2.83	<DL
11	3B	4.72	<DL	1.44	0.549	242	0.865	<DL
11	3C	1.93	<DL	1.01	0.116	122	0.242	<DL
11	3D	2.29	<DL	1.07	0.299	1780	0.282	<DL
11	3E	2.37	<DL	0.616	0.694	49.1	0.279	<DL
11	3F	2.42	<DL	0.65	0.972	2100	0.556	<DL
11	4A	3.06	<DL	2.04	0.0964	5930	0.678	<DL
11	4B	2.03	<DL	0.964	0.161	184	0.361	<DL
11	4C	1.31	<DL	0.603	0.0898	163	0.122	<DL
11	4D	1.56	<DL	0.491	0.123	601	0.175	<DL
11	4E	2.2	<DL	0.496	0.664	40.1	0.279	<DL
11	4F	2.28	<DL	0.527	1.03	760	0.585	<DL
11	5A	9.38	<DL	3.11	0.431	5920	1.03	<DL
11	5B	5.59	<DL	1.5	0.514	153	1.04	<DL
11	5C	1.34	<DL	0.769	0.0852	141	0.135	<DL
11	5D	1.44	<DL	0.678	0.1	480	0.135	<DL
11	5E	1.98	<DL	0.476	0.741	44.7	0.281	<DL
11	5F	2.32	<DL	0.467	1.09	361	0.678	<DL
11	6A	5.58	<DL	0.903	0.299	578	0.875	<DL
11	6B	3.83	<DL	1.29	0.403	232	0.858	<DL
11	6C	1.43	<DL	0.584	0.0874	180	0.131	<DL
11	6D	1.68	<DL	0.916	0.15	1990	0.177	<DL
11	6E	2.16	<DL	0.624	0.657	42.7	0.288	<DL
11	6F	2.31	<DL	0.621	0.955	333	0.578	<DL
11	BCAL	<DL	<DL	<DL	<DL	81.1	<DL	n.d.
11	BDOL	<DL	<DL	<DL	<DL	264	<DL	n.d.
11	R5	<DL	<DL	<DL	<DL	248	<DL	<DL
14	1A	7.89	<DL	2.26	0.207	627	1.68	<DL
14	1B	13.6	<DL	2.42	1.46	220	2.63	<DL
14	1C	1.69	<DL	0.877	0.21	115	0.409	0.076
14	1D	1.5	<DL	0.489	0.187	804	0.334	<DL
14	1E	2.13	<DL	0.501	0.726	42.6	0.291	<DL
14	1F	2.33	<DL	0.532	1.18	2820	0.571	<DL
14	2A	12.2	<DL	3.05	0.429	3470	1.93	<DL
14	2B	15	<DL	2.25	1.29	113	2.84	<DL
14	2C	2.13	<DL	1.28	0.297	173	0.4	<DL

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
14	2D	1.62	<DL	0.666	0.252	1550	0.311	<DL
14	2E	2.02	<DL	0.415	0.712	40.4	0.271	<DL
14	2F	2.13	<DL	0.556	1.02	295	0.578	<DL
14	3A	18.1	<DL	3.51	0.697	13800	3.06	<DL
14	3B	4.99	<DL	0.882	0.795	177	1.19	<DL
14	3C	1.8	<DL	0.935	0.19	112	0.278	0.076
14	3D	1.72	<DL	0.773	0.364	1080	0.284	<DL
14	3E	2.34	<DL	0.665	0.855	47	0.311	<DL
14	3F	2.36	<DL	0.628	1.07	2470	0.566	<DL
14	4A	2.67	<DL	1.24	0.0811	2660	0.644	0.0475
14	4B	2.14	<DL	0.797	0.196	174	0.43	<DL
14	4C	1.32	<DL	0.563	0.107	150	0.154	<DL
14	4D	1.28	<DL	<DL	0.116	515	0.159	0.0475
14	4E	2.02	<DL	0.459	0.802	38.9	0.307	<DL
14	4F	2.12	<DL	0.472	1.12	400	0.611	<DL
14	5A	3.57	<DL	1.19	0.142	902	0.55	<DL
14	5B	8.07	<DL	1.43	0.9	128	1.82	<DL
14	5C	1.28	<DL	0.724	0.106	135	0.15	<DL
14	5D	1.3	<DL	0.543	0.0977	411	0.147	<DL
14	5E	1.92	<DL	0.427	0.588	44.9	0.318	<DL
14	5F	2.21	<DL	0.493	1.1	237	0.633	<DL
14	6A	4.31	<DL	0.984	0.212	769	0.748	<DL
14	6B	4.4	<DL	1.08	0.497	228	1.08	<DL
14	6C	1.44	<DL	0.595	0.109	165	0.161	0.076
14	6D	1.63	<DL	0.885	0.224	1400	0.205	<DL
14	6E	2.23	<DL	0.578	0.68	42.2	0.318	<DL
14	6F	2.18	<DL	0.537	1.02	201	0.637	<DL
14	BCAL	<DL	<DL	<DL	<DL	45.8	<DL	n.d.
14	BDOL	<DL	<DL	<DL	<DL	126	<DL	n.d.
14	R6	<DL	<DL	<DL	<DL	155	<DL	<DL
18	1A	4.49	<DL	1.5	0.0921	297	0.969	<DL
18	1B	18.2	<DL	2.2	1.97	246	3.46	<DL
18	1C	1.72	<DL	0.649	0.209	107	0.401	<DL
18	1D	1.47	<DL	<DL	0.182	953	0.306	<DL
18	1E	2.05	<DL	0.416	0.612	38.9	0.277	<DL
18	1F	2.19	<DL	0.474	1.09	2080	0.555	<DL
18	2A	19.1	<DL	4.66	0.642	7430	3.15	<DL
18	2B	16.3	<DL	2.23	1.24	97.7	3.05	<DL
18	2C	1.93	<DL	0.756	0.274	173	0.372	<DL
18	2D	1.55	<DL	0.562	0.204	1620	0.312	<DL
18	2E	1.99	<DL	0.402	0.796	38.7	0.268	<DL
18	2F	2.17	<DL	0.533	0.938	275	0.569	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
18	3A	11.7	<DL	2.68	0.397	7980	1.9	<DL
18	3B	4.95	<DL	0.647	0.831	123	1.34	<DL
18	3C	1.64	<DL	0.657	0.164	110	0.289	<DL
18	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
18	3E	2.44	<DL	0.687	0.834	45.3	0.308	<DL
18	3F	2.33	<DL	0.58	0.895	2170	0.569	<DL
18	4A	1.6	<DL	0.796	<DL	844	0.39	0.095
18	4B	2.81	<DL	0.77	0.222	190	0.507	<DL
18	4C	1.27	<DL	0.49	0.101	142	0.148	<DL
18	4D	1.3	<DL	<DL	0.102	623	0.169	<DL
18	4E	2.15	<DL	0.41	0.715	37.9	0.321	<DL
18	4F	<DL	<DL	<DL	0.384	213	0.284	<DL
18	5A	3.25	<DL	1.37	0.139	2930	0.453	<DL
18	5B	8.97	<DL	1.11	1.02	95.1	2.15	<DL
18	5C	1.42	<DL	0.583	0.123	119	0.169	<DL
18	5D	<DL	<DL	<DL	<DL	245	<DL	<DL
18	5E	2.06	<DL	<DL	0.652	42.1	0.299	<DL
18	5F	2.17	<DL	<DL	0.989	256	0.607	<DL
18	6A	6.97	<DL	0.866	0.649	1580	1.33	<DL
18	6B	5.87	<DL	1.24	0.646	227	1.32	<DL
18	6C	1.42	<DL	0.512	0.1	165	0.147	<DL
18	6D	<DL	<DL	0.415	0.111	887	0.114	<DL
18	6E	2.13	<DL	0.587	0.789	40.4	0.309	<DL
18	6F	<DL	<DL	<DL	0.374	101	0.283	<DL
18	BCAL	<DL	<DL	<DL	<DL	96.5	<DL	n.d.
18	BDOL	<DL	<DL	<DL	<DL	181	<DL	n.d.
18	R1	<DL	<DL	<DL	<DL	265	<DL	<DL
21	1A	4.09	<DL	1.48	0.0847	364	0.843	<DL
21	1B	18.7	<DL	1.76	2.14	211	3.7	<DL
21	1C	1.8	<DL	0.561	0.204	104	0.407	<DL
21	1D	1.3	<DL	<DL	0.134	1200	0.278	<DL
21	1E	1.96	<DL	0.452	0.702	40.9	0.295	<DL
21	1F	2.07	<DL	0.444	0.968	1070	0.55	<DL
21	2A	11.9	<DL	3.02	0.383	4420	1.95	<DL
21	2B	18.2	<DL	2.68	1.32	103	3.26	<DL
21	2C	1.65	<DL	0.444	0.214	178	0.338	<DL
21	2D	1.38	<DL	0.452	0.179	7450	0.301	n.d.
21	2E	1.96	<DL	0.472	0.7	47.4	0.299	<DL
21	2F	2.04	<DL	0.583	0.873	249	0.556	<DL
21	3A	19.4	<DL	4.07	0.76	11000	3.33	<DL
21	3B	4.75	<DL	0.504	0.761	108	1.37	<DL
21	3C	1.44	<DL	<DL	0.162	109	0.276	<DL

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
21	3D	1.71	<DL	<DL	0.312	1450	0.307	0.181
21	3E	2.52	<DL	0.777	0.796	51.2	0.341	<DL
21	3F	2.16	<DL	0.641	0.855	1430	0.649	<DL
21	4A	2.56	<DL	0.922	0.0649	947	0.667	0.095
21	4B	3.31	<DL	0.79	0.343	209	0.768	<DL
21	4C	1.26	<DL	<DL	0.0935	144	0.143	<DL
21	4D	1.22	<DL	<DL	0.0783	320	0.131	<DL
21	4E	1.9	<DL	<DL	0.825	37	0.329	<DL
21	4F	1.94	<DL	<DL	0.97	226	0.55	<DL
21	5A	6.14	<DL	1.5	0.216	898	0.617	<DL
21	5B	10.3	<DL	1.03	1.33	116	2.56	<DL
21	5C	1.41	<DL	<DL	0.104	111	0.154	<DL
21	5D	1.28	<DL	<DL	0.0759	390	0.143	<DL
21	5E	1.85	<DL	0.426	0.664	53	0.308	<DL
21	5F	2	<DL	0.452	0.821	165	0.583	<DL
21	6A	6.93	<DL	1.44	0.287	439	1.05	<DL
21	6B	7.48	<DL	1.12	1.01	208	1.79	<DL
21	6C	1.37	<DL	<DL	0.105	165	0.172	<DL
21	6D	1.44	<DL	0.644	0.286	1020	0.24	<DL
21	6E	1.87	<DL	0.546	0.75	40.1	0.315	<DL
21	6F	1.96	<DL	0.575	0.951	117	0.578	<DL
21	BCAL	<DL	<DL	<DL	<DL	51.9	<DL	n.d.
21	BDOL	<DL	<DL	<DL	<DL	73.6	<DL	n.d.
21	R2	<DL	<DL	<DL	<DL	369	<DL	<DL
25	1A	2.63	<DL	1.24	0.0633	656	0.573	<DL
25	1B	16.3	<DL	1.5	1.88	206	3.33	<DL
25	1C	1.72	<DL	0.445	0.194	98.8	0.389	<DL
25	1D	1.39	<DL	<DL	0.155	970	0.276	<DL
25	1E	1.99	<DL	<DL	0.666	45.6	0.297	<DL
25	1F	2.13	<DL	0.414	0.918	1120	0.546	<DL
25	2A	10.7	<DL	2.98	0.355	4580	1.69	<DL
25	2B	17.9	<DL	2.5	1.3	107	3.19	<DL
25	2C	1.73	<DL	0.506	0.216	156	0.367	<DL
25	2D	<DL	<DL	<DL	<DL	48.8	<DL	n.d.
25	2E	1.89	<DL	<DL	0.785	44.3	0.289	<DL
25	2F	2.16	<DL	0.564	0.896	201	0.579	<DL
25	3A	9.29	<DL	2.11	0.32	4380	1.42	<DL
25	3B	3.82	<DL	<DL	0.64	121	1.07	<DL
25	3C	1.6	<DL	<DL	0.172	107	0.272	<DL
25	3D	1.65	<DL	<DL	0.262	112	0.23	<DL
25	3E	2.45	<DL	0.623	1.01	54.7	0.343	<DL
25	3F	2.46	<DL	0.532	0.882	1580	0.516	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
25	4A	1.98	<DL	0.684	<DL	1130	0.467	<DL
25	4B	3.12	<DL	<DL	0.464	181	0.934	<DL
25	4C	1.59	<DL	<DL	0.0941	147	0.155	<DL
25	4D	1.26	<DL	<DL	0.0797	652	0.136	<DL
25	4E	2.01	<DL	<DL	0.746	43.5	0.333	<DL
25	4F	2.17	<DL	<DL	0.868	404	0.553	<DL
25	5A	5.32	<DL	1.34	0.177	900	0.552	<DL
25	5B	10.6	<DL	0.942	1.39	147	2.71	<DL
25	5C	1.58	<DL	<DL	0.0937	116	0.182	<DL
25	5D	1.41	<DL	<DL	0.0617	668	0.145	<DL
25	5E	2.05	<DL	0.433	0.822	50.8	0.331	<DL
25	5F	2.19	<DL	<DL	1	340	0.57	<DL
25	6A	7.75	<DL	0.502	0.727	1430	1.48	<DL
25	6B	7.14	<DL	0.677	1.17	201	2.06	<DL
25	6C	1.63	<DL	<DL	0.129	160	0.183	<DL
25	6D	1.72	<DL	0.409	0.362	159	0.209	<DL
25	6E	2.09	<DL	0.555	0.789	43.9	0.348	<DL
25	6F	2.19	<DL	<DL	1.03	192	0.553	<DL
25	BCAL	<DL	<DL	<DL	<DL	52.7	<DL	n.d.
25	BDOL	<DL	<DL	<DL	<DL	152	<DL	n.d.
25	R3	<DL	<DL	<DL	<DL	223	<DL	<DL
28	1A	1.89	<DL	0.908	0.106	357	0.697	<DL
28	1B	11.5	<DL	1.1	1.29	203	2.41	<DL
28	1C	1.41	<DL	<DL	0.214	97	0.549	<DL
28	1D	<DL	<DL	<DL	0.186	1010	0.468	<DL
28	1E	1.33	<DL	<DL	0.702	39.7	0.47	<DL
28	1F	1.64	<DL	<DL	0.769	904	0.701	<DL
28	2A	5.93	<DL	1.38	0.188	25	1.05	<DL
28	2B	13.2	<DL	1.81	0.909	91.7	2.36	<DL
28	2C	1.12	<DL	<DL	0.203	124	0.521	<DL
28	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
28	2E	1.24	<DL	<DL	0.545	41.1	0.473	<DL
28	2F	1.64	<DL	0.55	0.888	129	0.696	<DL
28	3A	5.72	<DL	1.66	0.212	302	1.11	<DL
28	3B	2.4	<DL	<DL	0.462	133	0.973	<DL
28	3C	<DL	<DL	<DL	0.164	94.5	0.443	<DL
28	3D	<DL	<DL	<DL	0.224	127	0.467	<DL
28	3E	1.57	<DL	0.486	0.918	51.4	0.518	<DL
28	3F	1.65	<DL	0.422	0.82	881	0.694	<DL
28	4A	<DL	<DL	0.417	<DL	558	0.536	<DL
28	4B	2.22	<DL	<DL	0.483	171	1.04	<DL
28	4C	<DL	<DL	<DL	0.0986	152	0.374	<DL

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
28	4D	<DL	<DL	<DL	0.11	462	0.37	<DL
28	4E	1.35	<DL	<DL	0.763	38.6	0.507	<DL
28	4F	1.53	<DL	<DL	0.933	217	0.703	<DL
28	5A	3.76	<DL	0.966	0.164	529	0.655	<DL
28	5B	9.01	<DL	0.847	1.2	127	2.42	<DL
28	5C	1.19	<DL	<DL	0.124	117	0.41	<DL
28	5D	<DL	<DL	<DL	0.11	475	0.403	<DL
28	5E	1.3	<DL	<DL	0.761	46.1	0.485	<DL
28	5F	1.73	<DL	0.406	0.727	236	0.777	<DL
28	6A	3.86	<DL	0.442	0.372	760	24.7	<DL
28	6B	5.48	<DL	0.574	0.927	208	1.84	<DL
28	6C	1.08	<DL	<DL	0.121	162	0.405	<DL
28	6D	1.12	<DL	0.499	0.322	2560	0.425	<DL
28	6E	1.47	<DL	<DL	0.722	41.8	0.5	<DL
28	6F	1.51	<DL	<DL	0.953	147	0.721	<DL
28	BCAL	<DL	<DL	<DL	<DL	50.6	0.272	n.d.
28	BDOL	<DL	<DL	<DL	<DL	88.2	0.263	n.d.
28	R4	<DL	<DL	<DL	<DL	197	0.263	<DL
32	1A	1.69	<DL	0.74	0.0794	330	0.597	<DL
32	1B	8.53	<DL	0.912	0.932	231	1.9	<DL
32	1C	1.11	<DL	<DL	0.175	97.8	0.534	<DL
32	1D	<DL	<DL	<DL	0.171	610	0.444	<DL
32	1E	1.31	<DL	<DL	0.712	37.9	0.479	<DL
32	1F	1.59	<DL	<DL	0.94	225	0.684	<DL
32	2A	5.72	<DL	1.23	0.194	35.5	0.991	<DL
32	2B	12.3	<DL	1.7	0.841	97.9	2.18	<DL
32	2C	<DL	<DL	<DL	0.186	108	0.49	<DL
32	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
32	2E	1.38	<DL	<DL	0.79	42.1	0.493	<DL
32	2F	1.71	<DL	0.595	0.914	808	0.686	<DL
32	3A	4.02	<DL	1.06	0.146	81.4	0.852	<DL
32	3B	1.77	<DL	<DL	0.432	190	0.799	<DL
32	3C	<DL	<DL	<DL	0.149	103	0.429	<DL
32	3D	<DL	<DL	<DL	0.231	456	0.416	<DL
32	3E	1.62	<DL	0.476	0.907	175	0.517	<DL
32	3F	1.68	<DL	<DL	0.843	141	0.657	<DL
32	4A	<DL	<DL	0.41	<DL	543	0.462	<DL
32	4B	1.81	<DL	<DL	0.409	179	0.892	<DL
32	4C	<DL	<DL	<DL	0.112	138	0.373	<DL
32	4D	<DL	<DL	<DL	0.116	255	0.384	<DL
32	4E	1.48	<DL	<DL	0.78	38.6	0.532	<DL
32	4F	1.49	<DL	<DL	0.907	97.5	0.693	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
32	5A	3.29	<DL	0.748	0.106	167	0.587	<DL
32	5B	7.47	<DL	0.742	1.04	139	1.95	<DL
32	5C	<DL	<DL	<DL	0.124	96.5	0.388	<DL
32	5D	<DL	<DL	<DL	0.119	214	0.379	<DL
32	5E	1.52	<DL	<DL	0.767	46	0.506	<DL
32	5F	1.63	<DL	<DL	0.847	81.1	0.732	<DL
32	6A	2.94	<DL	<DL	0.44	285	0.882	<DL
32	6B	3.72	<DL	0.502	0.718	307	1.24	<DL
32	6C	1.03	<DL	<DL	0.141	148	0.394	<DL
32	6D	1.11	<DL	<DL	0.36	595	0.423	<DL
32	6E	1.46	<DL	<DL	0.806	39.6	0.495	<DL
32	6F	1.63	<DL	<DL	0.943	326	0.693	<DL
32	BCAL	<DL	<DL	<DL	<DL	137	0.268	n.d.
32	BDOL	<DL	<DL	<DL	<DL	117	0.284	n.d.
32	R5	<DL	<DL	<DL	<DL	105	0.264	<DL
35	1A	1.42	<DL	0.629	<DL	436	0.548	<DL
35	1B	6.38	<DL	0.796	0.862	290	1.72	<DL
35	1C	1.11	<DL	<DL	0.196	99.2	0.521	<DL
35	1D	1.04	<DL	<DL	0.19	625	0.489	<DL
35	1E	1.28	<DL	<DL	0.769	39.5	0.476	<DL
35	1F	2.18	<DL	<DL	1.04	461	0.746	<DL
35	2A	4.16	<DL	1.1	0.129	32.1	0.784	<DL
35	2B	9.92	<DL	1.55	0.763	109	1.95	<DL
35	2C	1.04	<DL	<DL	0.191	99.9	0.517	<DL
35	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
35	2E	1.46	<DL	<DL	0.907	45.1	0.526	<DL
35	2F	1.9	<DL	0.663	1.05	1100	0.765	<DL
35	3A	2.54	<DL	0.798	0.0894	57.2	0.71	<DL
35	3B	2.05	<DL	<DL	0.457	227	0.824	<DL
35	3C	<DL	<DL	<DL	0.144	123	0.456	<DL
35	3D	<DL	<DL	<DL	0.311	1150	0.427	<DL
35	3E	1.82	<DL	0.696	1.35	125	0.659	1.91
35	3F	1.82	<DL	<DL	0.973	230	0.727	<DL
35	4A	<DL	<DL	<DL	<DL	320	0.464	<DL
35	4B	1.61	<DL	<DL	0.443	214	0.907	<DL
35	4C	<DL	<DL	<DL	0.107	157	0.381	<DL
35	4D	<DL	<DL	<DL	0.118	364	0.395	<DL
35	4E	1.42	<DL	<DL	0.896	40.1	0.561	<DL
35	4F	1.63	<DL	<DL	1.09	231	0.776	<DL
35	5A	2.07	<DL	0.724	0.0722	187	0.499	<DL
35	5B	6.28	<DL	0.779	1.08	174	1.98	<DL
35	5C	1.08	<DL	<DL	0.129	107	0.397	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
35	5D	<DL	<DL	<DL	0.12	347	0.393	<DL
35	5E	2.01	<DL	<DL	0.813	65.4	0.296	<DL
35	5F	2.14	<DL	<DL	0.918	208	0.508	<DL
35	6A	2.37	<DL	<DL	0.225	663	0.25	<DL
35	6B	3.76	<DL	<DL	0.725	399	1.01	<DL
35	6C	1.16	<DL	<DL	0.153	270	0.136	<DL
35	6D	1.32	<DL	<DL	0.315	1640	0.171	<DL
35	6E	1.81	<DL	<DL	0.74	61.1	0.255	<DL
35	6F	1.85	<DL	<DL	0.901	298	0.474	<DL
35	BCAL	<DL	<DL	<DL	<DL	122	<DL	n.d.
35	BDOL	<DL	<DL	<DL	<DL	109	<DL	n.d.
35	R6	<DL	<DL	<DL	<DL	82	<DL	<DL
39	1A	1.81	<DL	1.12	0.0788	952	0.303	<DL
39	1B	6.24	<DL	0.738	0.755	476	1.21	<DL
39	1C	1.25	<DL	<DL	0.186	126	0.245	<DL
39	1D	1.24	<DL	<DL	0.159	897	0.214	<DL
39	1E	1.76	<DL	<DL	0.785	56.4	0.239	<DL
39	1F	2.07	<DL	<DL	0.87	410	0.462	<DL
39	2A	4.92	<DL	0.507	0.143	97.9	0.517	<DL
39	2B	9.33	<DL	0.777	0.625	175	1.36	<DL
39	2C	1.22	<DL	<DL	0.176	114	0.219	<DL
39	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
39	2E	1.66	<DL	<DL	0.887	57.6	0.249	<DL
39	2F	1.95	<DL	<DL	0.87	889	0.438	<DL
39	3A	2.23	<DL	<DL	0.104	142	0.321	<DL
39	3B	1.71	<DL	<DL	0.376	321	0.47	<DL
39	3C	<DL	<DL	<DL	0.144	161	0.135	<DL
39	3D	1.02	<DL	<DL	0.198	1190	0.133	<DL
39	3E	1.82	<DL	<DL	1.19	107	0.316	1.88
39	3F	1.88	<DL	<DL	0.855	275	0.415	<DL
39	4A	<DL	<DL	<DL	<DL	1100	0.172	<DL
39	4B	1.3	<DL	<DL	0.382	395	0.441	<DL
39	4C	<DL	<DL	<DL	0.111	214	<DL	0.124
39	4D	<DL	<DL	<DL	0.112	640	0.106	0.124
39	4E	1.53	<DL	<DL	0.813	57.4	0.265	0.124
39	4F	1.64	<DL	<DL	0.869	301	0.459	<DL
39	5A	1.05	<DL	<DL	<DL	342	0.111	<DL
39	5B	5.12	<DL	<DL	0.743	305	1.2	0.152
39	5C	1.63	<DL	<DL	0.0947	144	0.101	0.124
39	5D	<DL	<DL	<DL	0.123	464	0.118	0.152
39	5E	1.5	<DL	<DL	0.86	64.8	0.248	<DL
39	5F	1.52	<DL	<DL	0.902	258	0.47	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
39	6A	1.84	<DL	<DL	0.372	1290	0.308	0.152
39	6B	2.87	<DL	<DL	0.6	474	0.8	0.152
39	6C	1	<DL	<DL	0.141	312	0.131	0.152
39	6D	1.21	<DL	<DL	0.306	1320	0.174	0.124
39	6E	1.49	<DL	<DL	0.841	61.4	0.241	<DL
39	6F	1.6	<DL	<DL	0.952	220	0.46	<DL
39	BCAL	<DL	<DL	<DL	<DL	101	<DL	n.d.
39	BDOL	<DL	<DL	<DL	<DL	76.7	<DL	n.d.
39	R1	<DL	<DL	<DL	<DL	113	<DL	<DL
42	1A	<DL	<DL	0.477	<DL	822	0.196	n.d.
42	1B	4.04	<DL	0.673	0.638	423	0.883	<DL
42	1C	1.14	<DL	<DL	0.171	121	0.239	0.124
42	1D	<DL	<DL	<DL	0.174	642	0.199	0.124
42	1E	1.43	<DL	<DL	0.811	50.5	0.24	<DL
42	1F	1.88	<DL	<DL	1.02	221	0.444	<DL
42	2A	2.74	<DL	0.672	0.11	91.4	0.327	<DL
42	2B	5.86	<DL	1.07	0.556	185	1.01	<DL
42	2C	1.01	<DL	<DL	0.166	116	0.284	0.124
42	2D	1.13	<DL	<DL	0.223	220	0.285	2.66
42	2E	1.37	<DL	<DL	0.895	52.5	0.257	<DL
42	2F	1.86	<DL	0.419	1.06	532	0.606	<DL
42	3A	1.86	<DL	0.638	0.105	119	0.305	<DL
42	3B	1.5	<DL	<DL	0.424	275	0.432	0.124
42	3C	<DL	<DL	<DL	0.123	157	0.139	0.124
42	3D	<DL	<DL	<DL	0.214	1170	0.144	<DL
42	3E	1.41	<DL	<DL	1.41	121	0.405	<DL
42	3F	1.66	<DL	<DL	0.907	217	0.404	<DL
42	4A	<DL	<DL	<DL	<DL	748	0.124	<DL
42	4B	1.09	<DL	<DL	0.384	431	0.389	<DL
42	4C	<DL	<DL	<DL	0.127	239	0.124	0.124
42	4D	<DL	<DL	<DL	0.132	521	0.126	0.124
42	4E	1.31	<DL	<DL	0.884	52.7	0.28	0.124
42	4F	1.52	<DL	<DL	0.921	252	0.458	<DL
42	5A	<DL	<DL	0.42	<DL	228	0.108	<DL
42	5B	3.39	<DL	0.491	0.736	354	0.888	<DL
42	5C	<DL	<DL	<DL	0.126	138	0.124	0.124
42	5D	<DL	<DL	<DL	0.121	475	0.135	0.124
42	5E	1.24	<DL	<DL	0.907	61.4	0.256	<DL
42	5F	1.49	<DL	<DL	0.921	185	0.458	<DL
42	6A	1.76	<DL	<DL	0.2	474	0.268	<DL
42	6B	2.47	<DL	0.443	0.643	564	0.726	<DL
42	6C	<DL	<DL	<DL	0.148	318	0.145	0.124

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
42	6D	1.1	<DL	<DL	0.211	1080	0.173	<DL
42	6E	1.47	<DL	<DL	0.887	55.4	0.258	<DL
42	6F	1.6	<DL	<DL	0.904	153	0.44	<DL
42	BCAL	<DL	<DL	<DL	<DL	74.9	<DL	n.d.
42	BDOL	<DL	<DL	<DL	<DL	72.5	<DL	n.d.
42	R2	<DL	<DL	<DL	<DL	103	<DL	<DL
47	1A	n.d.	n.d.	1.04	n.d.	2650	0.4075	0.166
47	1B	3.14	<DL	0.522	0.582	495	0.716	<DL
47	1C	<DL	<DL	<DL	0.168	114	0.205	0.19
47	1D	<DL	<DL	<DL	0.166	1370	0.321	<DL
47	1E	1.28	<DL	<DL	0.757	55.7	0.229	<DL
47	1F	1.59	<DL	<DL	0.896	318	0.813	<DL
47	2A	1.95	<DL	0.58	0.102	192	0.253	<DL
47	2B	3.75	<DL	0.782	0.425	292	0.682	<DL
47	2C	<DL	<DL	<DL	0.16	109	0.311	0.19
47	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
47	2E	1.31	<DL	<DL	0.922	55.3	0.253	<DL
47	2F	1.61	<DL	<DL	1.04	593	0.436	<DL
47	3A	1.44	<DL	0.521	0.067	84.1	0.271	<DL
47	3B	1.27	<DL	<DL	0.405	332	0.392	<DL
47	3C	<DL	<DL	<DL	0.115	160	0.13	0.19
47	3D	<DL	<DL	<DL	0.225	1750	0.144	<DL
47	3E	1.56	<DL	0.546	1.23	135	0.401	0.0475
47	3F	1.54	<DL	<DL	0.882	331	0.393	<DL
47	4A	<DL	<DL	<DL	<DL	517	0.234	<DL
47	4B	<DL	<DL	<DL	0.437	514	0.335	<DL
47	4C	<DL	<DL	<DL	0.126	248	0.135	<DL
47	4D	<DL	<DL	<DL	0.146	697	0.127	<DL
47	4E	1.56	<DL	<DL	0.891	47.9	0.263	<DL
47	4F	1.6	<DL	<DL	0.852	306	0.444	<DL
47	5A	<DL	<DL	<DL	<DL	374	0.119	<DL
47	5B	2.9	<DL	0.533	0.694	636	0.708	<DL
47	5C	<DL	<DL	<DL	0.113	123	0.113	0.219
47	5D	<DL	<DL	<DL	0.131	724	0.123	<DL
47	5E	1.35	<DL	<DL	1	61.3	0.256	<DL
47	5F	1.61	<DL	<DL	0.939	270	0.489	<DL
47	6A	2.04	<DL	<DL	0.239	831	0.302	<DL
47	6B	2.23	<DL	0.486	0.655	767	0.638	<DL
47	6C	<DL	<DL	<DL	0.166	348	0.154	<DL
47	6D	1.05	<DL	<DL	0.193	1210	0.179	<DL
47	6E	1.42	<DL	<DL	0.959	58.2	0.275	<DL
47	6F	1.6	<DL	<DL	0.969	281	0.458	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Ti	Tl	V	Y	Zn	Zr	F-
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
		1	0.6	0.4	0.06	1	0.1	0.029
47	BCAL	<DL	<DL	<DL	<DL	82.8	<DL	n.d.
47	BDOL	<DL	<DL	<DL	<DL	76.8	<DL	n.d.
47	R3	<DL	<DL	<DL	<DL	116	<DL	<DL
49	1A	<DL	<DL	0.497	<DL	314	0.199	<DL
49	1B	3.08	<DL	0.475	0.533	408	0.606	<DL
49	1C	<DL	<DL	<DL	0.166	121	0.147	<DL
49	1D	<DL	<DL	<DL	0.164	644	0.118	<DL
49	1E	1.27	<DL	<DL	0.792	47.4	0.16	<DL
49	1F	1.56	<DL	<DL	0.929	175	0.365	<DL
49	2A	1.66	<DL	0.601	0.077	157	0.151	<DL
49	2B	3.21	<DL	0.689	0.417	268	0.511	<DL
49	2C	<DL	<DL	<DL	0.144	96.8	0.123	<DL
49	2D	<DL	<DL	<DL	0.169	207	0.106	<DL
49	2E	1.22	<DL	<DL	0.942	46.2	0.182	<DL
49	2F	1.51	<DL	<DL	1.02	421	0.339	<DL
49	3A	1.92	<DL	0.663	0.0842	66.3	0.252	0.247
49	3B	1.34	<DL	<DL	0.41	257	0.345	<DL
49	3C	<DL	<DL	<DL	0.119	175	<DL	0.162
49	3D	<DL	<DL	<DL	0.278	1030	0.113	<DL
49	3E	1.63	<DL	0.565	1.59	116	0.292	0.0475
49	3F	1.6	<DL	<DL	0.917	190	0.353	<DL
49	4A	<DL	<DL	<DL	<DL	469	<DL	<DL
49	4B	<DL	<DL	<DL	0.428	442	0.262	<DL
49	4C	<DL	<DL	<DL	0.12	275	<DL	<DL
49	4D	<DL	<DL	<DL	0.136	553	<DL	<DL
49	4E	1.25	<DL	<DL	0.942	68.4	0.199	<DL
49	4F	1.38	<DL	<DL	0.853	145	0.34	<DL
49	5A	1.14	<DL	0.534	<DL	344	<DL	<DL
49	5B	2.35	<DL	0.452	0.66	655	0.517	<DL
49	5C	<DL	<DL	<DL	0.12	148	<DL	<DL
49	5D	<DL	<DL	<DL	0.128	391	<DL	<DL
49	5E	1.09	<DL	<DL	0.978	52.5	0.179	<DL
49	5F	1.4	<DL	<DL	0.889	132	2.63	<DL
49	6A	2.27	<DL	<DL	0.297	676	0.282	<DL
49	6B	2.03	<DL	<DL	0.6	636	0.496	<DL
49	6C	<DL	<DL	<DL	0.153	381	<DL	<DL
49	6D	<DL	<DL	0.409	0.182	1280	<DL	<DL
49	6E	1.25	<DL	<DL	0.98	52.3	0.194	<DL
49	6F	1.38	<DL	<DL	0.911	124	0.355	<DL
49	BCAL	<DL	<DL	<DL	<DL	70.7	<DL	n.d.
49	BDOL	<DL	<DL	<DL	<DL	70.6	<DL	n.d.
49	R4	<DL	<DL	<DL	<DL	46.8	<DL	<DL

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
53	1A	1.12	<DL	0.679	<DL	672	0.185	<DL
53	1B	2.93	<DL	0.525	0.519	377	0.608	0.271
53	1C	<DL	<DL	<DL	0.184	137	0.168	<DL
53	1D	<DL	<DL	<DL	0.163	1130	0.117	<DL
53	1E	1.37	<DL	<DL	0.816	49	0.186	<DL
53	1F	1.62	<DL	<DL	0.946	256	0.358	<DL
53	2A	1.53	<DL	0.58	0.0864	166	0.16	<DL
53	2B	3.02	<DL	0.669	0.368	320	0.467	<DL
53	2C	<DL	<DL	<DL	0.151	99.5	0.132	<DL
53	2D	<DL	<DL	<DL	0.147	174	0.111	<DL
53	2E	1.31	<DL	<DL	0.955	50.4	0.18	<DL
53	2F	1.62	<DL	<DL	1.1	394	0.375	<DL
53	3A	2.1	<DL	0.676	0.111	106	0.275	<DL
53	3B	1.22	<DL	<DL	0.384	261	0.325	<DL
53	3C	<DL	<DL	<DL	0.127	188	<DL	<DL
53	3D	<DL	<DL	<DL	0.28	1540	0.103	<DL
53	3E	n.d.	n.d.	0.7455	1.5	107.25	0.243	n.d.
53	3F	1.56	<DL	<DL	0.909	298	0.337	<DL
53	4A	<DL	<DL	<DL	<DL	1630	0.107	n.d.
53	4B	<DL	<DL	<DL	0.475	518	0.252	<DL
53	4C	<DL	<DL	<DL	0.124	277	<DL	<DL
53	4D	<DL	<DL	<DL	0.145	722	<DL	<DL
53	4E	1.14	<DL	<DL	0.876	45.3	0.193	<DL
53	4F	1.34	<DL	<DL	0.854	205	0.35	<DL
53	5A	<DL	<DL	0.586	<DL	575	<DL	<DL
53	5B	2.51	<DL	0.43	0.758	862	0.511	<DL
53	5C	<DL	<DL	<DL	0.129	166	<DL	<DL
53	5D	<DL	<DL	<DL	0.154	585	<DL	<DL
53	5E	1.15	<DL	<DL	0.933	54.9	0.172	<DL
53	5F	1.43	<DL	<DL	0.924	205	0.357	<DL
53	6A	2.37	<DL	<DL	0.215	954	0.24	<DL
53	6B	1.93	<DL	<DL	0.597	619	0.492	<DL
53	6C	<DL	<DL	<DL	0.185	436	<DL	<DL
53	6D	<DL	<DL	<DL	0.172	1150	<DL	<DL
53	6E	1.16	<DL	<DL	0.892	53.7	0.178	<DL
53	6F	1.31	<DL	<DL	0.89	286	0.335	<DL
53	BCAL	<DL	<DL	<DL	<DL	265	<DL	n.d.
53	BDOL	<DL	<DL	<DL	<DL	118	<DL	n.d.
53	R5	<DL	<DL	<DL	<DL	88.8	<DL	<DL
56	1A	1.53	<DL	0.697	0.066	388	0.35	<DL
56	1B	2.72	<DL	0.478	0.515	378	0.684	<DL
56	1C	<DL	<DL	<DL	0.156	154	0.224	<DL

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
56	1D	<DL	<DL	<DL	0.159	586	0.193	<DL
56	1E	1.27	<DL	<DL	0.68	54	0.354	<DL
56	1F	1.49	<DL	<DL	0.862	126	0.443	<DL
56	2A	1.52	<DL	0.616	0.0816	162	0.254	<DL
56	2B	2.93	<DL	0.669	0.367	333	0.574	<DL
56	2C	<DL	<DL	<DL	0.135	126	0.189	0.0485
56	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
56	2E	1.17	<DL	<DL	0.914	57.9	0.269	<DL
56	2F	1.5	<DL	<DL	1.05	351	0.452	<DL
56	3A	2.58	<DL	0.875	0.166	129	0.461	n.d.
56	3B	1.1	<DL	<DL	0.375	270	0.409	<DL
56	3C	<DL	<DL	<DL	0.105	228	0.14	<DL
56	3D	<DL	<DL	<DL	0.265	816	0.22	<DL
56	3E	n.d.	n.d.	n.d.	1.56	114.15	0.351	<DL
56	3F	1.45	<DL	<DL	0.812	244	0.421	<DL
56	4A	<DL	<DL	<DL	<DL	585	0.171	<DL
56	4B	1.04	<DL	<DL	0.453	546	0.333	<DL
56	4C	<DL	<DL	<DL	0.106	346	0.139	<DL
56	4D	<DL	<DL	<DL	0.124	538	0.129	<DL
56	4E	1.16	<DL	<DL	0.788	53.1	0.333	<DL
56	4F	1.28	<DL	<DL	0.752	197	0.437	<DL
56	5A	<DL	<DL	0.488	<DL	431	0.12	<DL
56	5B	2.3	<DL	0.561	0.766	912	0.567	<DL
56	5C	<DL	<DL	<DL	0.111	210	0.111	<DL
56	5D	<DL	<DL	<DL	0.141	503	0.131	<DL
56	5E	1.14	<DL	<DL	0.889	64	0.265	<DL
56	5F	1.29	<DL	<DL	0.757	234	0.424	<DL
56	6A	2.32	<DL	0.401	0.265	549	0.383	<DL
56	6B	1.83	<DL	<DL	0.566	624	0.577	<DL
56	6C	<DL	<DL	<DL	0.162	520	0.148	<DL
56	6D	<DL	<DL	<DL	0.129	794	0.179	<DL
56	6E	1.26	<DL	<DL	0.824	65.9	0.277	<DL
56	6F	1.37	<DL	<DL	0.729	230	0.415	<DL
56	BCAL	<DL	<DL	<DL	<DL	213	<DL	n.d.
56	BDOL	<DL	<DL	<DL	<DL	103	<DL	n.d.
56	R6	<DL	<DL	<DL	<DL	66.4	<DL	<DL
60	1A	1.36	<DL	0.539	<DL	341	0.319	<DL
60	1B	2.54	<DL	0.478	0.505	352	0.671	<DL
60	1C	<DL	<DL	<DL	0.15	157	0.217	<DL
60	1D	<DL	<DL	<DL	0.183	461	0.217	<DL
60	1E	1.1	<DL	<DL	0.675	54.2	0.24	<DL
60	1F	1.39	<DL	<DL	0.803	61.3	0.653	<DL

Table 13: cont

		Element, Unit, Detection Limit						
Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
60	2A	1.43	<DL	0.634	0.0774	147	0.253	<DL
60	2B	2.8	<DL	0.648	0.366	338	0.615	<DL
60	2C	<DL	<DL	<DL	0.125	124	0.194	<DL
60	2D	n.d.	n.d.	n.d.	0.1515	396	0.2295	n.d.
60	2E	1.15	<DL	<DL	0.917	57	0.269	<DL
60	2F	1.42	<DL	<DL	1.12	199	0.456	<DL
60	3A	1.98	<DL	0.691	0.129	89.8	0.384	<DL
60	3B	1.08	<DL	<DL	0.347	277	0.376	<DL
60	3C	<DL	<DL	<DL	0.106	257	0.132	<DL
60	3D	<DL	<DL	<DL	0.287	610	0.242	<DL
60	3E	n.d.	n.d.	n.d.	1.35	119.4	0.357	n.d.
60	3F	1.29	<DL	<DL	0.758	78.9	0.515	<DL
60	4A	<DL	<DL	<DL	<DL	658	0.211	<DL
60	4B	<DL	<DL	<DL	0.497	581	0.332	<DL
60	4C	<DL	<DL	<DL	0.112	402	0.154	<DL
60	4D	<DL	<DL	<DL	0.15	546	0.133	<DL
60	4E	1.3	<DL	<DL	0.852	51.8	0.279	<DL
60	4F	1.35	<DL	<DL	0.696	56	0.405	<DL
60	5A	1.03	<DL	0.485	<DL	155	0.151	<DL
60	5B	2.43	<DL	0.453	0.753	902	0.569	n.d.
60	5C	<DL	<DL	<DL	0.134	246	0.125	<DL
60	5D	<DL	<DL	<DL	0.193	511	0.139	<DL
60	5E	1.16	<DL	<DL	0.947	72.9	0.256	<DL
60	5F	1.3	<DL	<DL	0.757	69.7	0.596	<DL
60	6A	2.37	<DL	0.411	0.278	258	0.398	<DL
60	6B	1.58	<DL	<DL	0.559	605	0.56	<DL
60	6C	<DL	<DL	<DL	0.181	567	0.173	<DL
60	6D	<DL	<DL	<DL	0.128	407	0.155	<DL
60	6E	1.14	<DL	<DL	0.866	60.7	0.313	<DL
60	6F	1.24	<DL	<DL	0.722	66.4	0.405	<DL
60	BCAL	<DL	<DL	<DL	<DL	244	<DL	n.d.
60	BDOL	<DL	<DL	<DL	<DL	70.4	<DL	n.d.
60	R1	<DL	<DL	<DL	<DL	96.1	<DL	<DL
63	1A	1.48	<DL	0.55	0.068	236	0.476	<DL
63	1B	2.44	<DL	0.428	0.465	309	0.805	<DL
63	1C	<DL	<DL	<DL	0.147	169	0.823	<DL
63	1D	<DL	<DL	<DL	0.197	476	0.356	<DL
63	1E	1.15	<DL	<DL	0.636	53.7	0.416	<DL
63	1F	1.39	<DL	<DL	0.826	74.9	0.604	<DL
63	2A	1.14	<DL	0.502	0.0658	96.5	0.358	<DL
63	2B	2.8	<DL	0.609	0.357	316	0.7	<DL
63	2C	<DL	<DL	<DL	0.137	132	0.338	<DL

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
63	2D	<DL	<DL	<DL	0.247	352	0.4	<DL
63	2E	1.12	<DL	<DL	0.914	61.8	0.44	<DL
63	2F	1.4	<DL	<DL	1.15	189	0.616	<DL
63	3A	2.02	<DL	0.592	0.112	80.8	0.531	<DL
63	3B	1.14	<DL	<DL	0.36	259	0.551	<DL
63	3C	<DL	<DL	<DL	0.134	284	0.303	<DL
63	3D	<DL	<DL	<DL	0.328	582	0.357	<DL
63	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
63	3F	1.41	<DL	<DL	0.816	75.3	0.657	<DL
63	4A	<DL	<DL	<DL	<DL	695	0.36	<DL
63	4B	<DL	<DL	<DL	0.542	527	0.49	<DL
63	4C	<DL	<DL	<DL	0.171	487	0.285	<DL
63	4D	<DL	<DL	<DL	0.21	650	0.291	<DL
63	4E	1.19	<DL	<DL	0.937	58.6	0.438	<DL
63	4F	2.26	<DL	<DL	0.712	76	0.547	<DL
63	5A	1.15	<DL	0.41	<DL	179	0.305	<DL
63	5B	2.34	<DL	<DL	0.736	738	0.708	<DL
63	5C	<DL	<DL	<DL	0.182	297	0.285	<DL
63	5D	<DL	<DL	<DL	0.275	575	0.298	<DL
63	5E	1.2	<DL	<DL	0.962	74.2	0.429	<DL
63	5F	1.37	<DL	<DL	0.801	89.9	0.589	<DL
63	6A	2.41	<DL	0.455	0.223	171	0.496	<DL
63	6B	1.64	<DL	<DL	0.591	555	0.708	<DL
63	6C	<DL	<DL	<DL	0.2	562	0.297	<DL
63	6D	<DL	<DL	<DL	0.131	332	0.311	<DL
63	6E	1.11	<DL	<DL	0.859	63.7	0.442	<DL
63	6F	1.21	<DL	<DL	0.708	71.7	0.547	<DL
63	BCAL	<DL	<DL	<DL	<DL	193	0.205	n.d.
63	BDOL	<DL	<DL	<DL	<DL	61.8	0.199	n.d.
63	R2	<DL	<DL	<DL	<DL	94.6	0.197	<DL
67	1A	<DL	<DL	0.413	<DL	187	0.352	<DL
67	1B	2.26	<DL	0.415	0.466	339	0.771	<DL
67	1C	<DL	<DL	<DL	0.169	185	0.504	<DL
67	1D	<DL	<DL	<DL	0.258	1060	0.357	<DL
67	1E	1.18	<DL	<DL	0.697	52.8	0.404	<DL
67	1F	1.38	<DL	<DL	0.801	237	0.574	<DL
67	2A	1.24	<DL	0.513	0.072	104	0.363	<DL
67	2B	2.7	<DL	0.559	0.349	315	0.694	<DL
67	2C	<DL	<DL	<DL	0.152	137	0.339	<DL
67	2D	<DL	<DL	<DL	0.294	447	0.424	<DL
67	2E	1.17	<DL	<DL	0.899	64.9	0.418	<DL
67	2F	1.35	<DL	<DL	1.11	400	0.599	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
67	3A	1.7	<DL	0.544	0.0978	79.1	0.447	<DL
67	3B	<DL	<DL	<DL	0.348	248	0.543	<DL
67	3C	<DL	<DL	<DL	0.15	340	0.288	<DL
67	3D	<DL	<DL	<DL	0.454	1410	0.405	<DL
67	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
67	3F	1.33	<DL	<DL	0.774	250	0.6	<DL
67	4A	<DL	<DL	<DL	<DL	533	0.376	<DL
67	4B	<DL	<DL	<DL	0.524	488	0.49	<DL
67	4C	<DL	<DL	<DL	0.17	582	0.285	<DL
67	4D	<DL	<DL	<DL	0.252	1020	0.305	<DL
67	4E	1.11	<DL	<DL	0.991	66.8	0.422	<DL
67	4F	1.11	<DL	<DL	0.739	439	0.524	<DL
67	5A	1.04	<DL	0.482	<DL	863	0.305	<DL
67	5B	1.98	<DL	0.401	0.661	663	0.685	<DL
67	5C	<DL	<DL	<DL	0.201	306	0.295	<DL
67	5D	<DL	<DL	<DL	0.351	870	0.299	<DL
67	5E	1.13	<DL	<DL	1.39	81.3	0.394	<DL
67	5F	1.25	<DL	<DL	1.13	232	0.484	<DL
67	6A	1.57	<DL	<DL	0.418	751	0.365	<DL
67	6B	1.56	<DL	<DL	0.686	558	0.628	<DL
67	6C	<DL	<DL	<DL	0.396	791	0.277	<DL
67	6D	<DL	<DL	<DL	0.178	579	0.264	<DL
67	6E	1.13	<DL	<DL	1.2	65.8	0.418	<DL
67	6F	1.16	<DL	<DL	0.818	203	0.483	<DL
67	BCAL	<DL	<DL	<DL	<DL	307	0.159	n.d.
67	BDOL	<DL	<DL	<DL	<DL	61.5	0.153	n.d.
67	R3	<DL	<DL	<DL	<DL	88.4	0.152	<DL
70	1A	<DL	<DL	0.427	<DL	251	0.171	n.d.
70	1B	2.65	<DL	<DL	0.494	454	0.598	n.d.
70	1C	<DL	<DL	<DL	0.145	190	0.392	n.d.
70	1D	<DL	<DL	<DL	0.282	942	0.148	n.d.
70	1E	1.06	<DL	<DL	0.708	31.9	0.197	n.d.
70	1F	1.24	<DL	<DL	0.857	134	0.363	n.d.
70	2A	1.36	<DL	0.52	0.0629	96.8	0.161	n.d.
70	2B	2.84	<DL	0.555	0.35	346	0.464	n.d.
70	2C	<DL	<DL	<DL	0.161	153	0.12	n.d.
70	2D	<DL	<DL	<DL	0.399	655	0.2	n.d.
70	2E	1.06	<DL	<DL	1.02	48	0.211	n.d.
70	2F	1.21	<DL	<DL	1.22	375	0.377	n.d.
70	3A	2.12	<DL	0.648	0.117	107	0.535	n.d.
70	3B	1.02	<DL	<DL	0.346	252	0.321	n.d.
70	3C	<DL	<DL	<DL	0.179	461	<DL	n.d.

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
70	3D	<DL	<DL	<DL	0.493	1520	0.164	n.d.
70	3E	1.15	<DL	0.403	0.908	114	0.304	n.d.
70	3F	1.2	<DL	<DL	0.811	134	0.334	n.d.
70	4A	<DL	<DL	<DL	<DL	1340	0.173	n.d.
70	4B	<DL	<DL	<DL	0.437	528	0.264	n.d.
70	4C	<DL	<DL	<DL	0.172	837	<DL	n.d.
70	4D	<DL	<DL	<DL	0.313	1250	<DL	n.d.
70	4E	<DL	<DL	<DL	1.01	50.3	0.233	n.d.
70	4F	<DL	<DL	<DL	0.794	162	0.288	n.d.
70	5A	1.17	<DL	0.598	<DL	536	0.103	n.d.
70	5B	1.98	<DL	<DL	0.662	723	0.451	n.d.
70	5C	<DL	<DL	<DL	0.208	374	<DL	n.d.
70	5D	<DL	<DL	<DL	0.415	980	<DL	n.d.
70	5E	1	<DL	<DL	1.21	80.7	0.207	n.d.
70	5F	1.07	<DL	<DL	0.874	150	0.43	n.d.
70	6A	1.69	<DL	<DL	0.134	312	0.199	n.d.
70	6B	1.66	<DL	<DL	0.513	610	0.476	n.d.
70	6C	<DL	<DL	<DL	0.282	920	<DL	n.d.
70	6D	<DL	<DL	<DL	0.13	332	<DL	n.d.
70	6E	1.16	<DL	<DL	0.963	56.2	0.247	n.d.
70	6F	1.09	<DL	<DL	0.889	108	0.275	n.d.
70	BCAL	<DL	<DL	<DL	<DL	123	<DL	n.d.
70	BDOL	<DL	<DL	<DL	<DL	55.6	<DL	n.d.
70	R4	<DL	<DL	<DL	<DL	57.5	<DL	n.d.
74	1A	1.03	<DL	0.654	<DL	1510	0.158	<DL
74	1B	1.73	<DL	<DL	0.395	276	0.393	<DL
74	1C	<DL	<DL	<DL	0.163	207	0.127	<DL
74	1D	<DL	<DL	<DL	0.396	954	0.124	<DL
74	1E	<DL	<DL	<DL	0.841	52	0.172	<DL
74	1F	1.13	<DL	<DL	0.882	123	0.331	<DL
74	2A	1.25	<DL	0.567	0.0799	99.9	0.128	<DL
74	2B	2.61	<DL	0.573	0.366	267	0.439	<DL
74	2C	<DL	<DL	<DL	0.178	145	<DL	<DL
74	2D	1.04	<DL	<DL	0.549	638	0.268	<DL
74	2E	1.03	<DL	<DL	1.12	68.6	0.179	<DL
74	2F	1.16	<DL	<DL	1.28	329	0.341	<DL
74	3A	1.67	<DL	0.5	0.0903	78.6	0.205	<DL
74	3B	1.01	<DL	<DL	0.337	208	0.295	<DL
74	3C	<DL	<DL	<DL	0.181	366	<DL	<DL
74	3D	<DL	<DL	<DL	0.459	951	0.157	<DL
74	3E	1.1	<DL	0.44	0.95	100	0.253	<DL
74	3F	1.1	<DL	<DL	0.772	133	0.291	<DL

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
74	4A	<DL	<DL	0.414	<DL	1080	0.167	<DL
74	4B	<DL	<DL	<DL	0.424	397	0.244	<DL
74	4C	<DL	<DL	<DL	0.134	486	<DL	<DL
74	4D	<DL	<DL	<DL	0.363	996	<DL	<DL
74	4E	1.22	<DL	<DL	1.08	71.6	0.196	<DL
74	4F	1.24	<DL	<DL	0.778	219	0.264	<DL
74	5A	1.2	<DL	0.725	0.0629	622	0.101	<DL
74	5B	1.91	<DL	<DL	0.575	518	0.485	<DL
74	5C	<DL	<DL	<DL	0.227	325	<DL	<DL
74	5D	<DL	<DL	<DL	0.48	865	<DL	<DL
74	5E	1.09	<DL	<DL	1.37	103	0.192	<DL
74	5F	1.17	<DL	<DL	0.853	137	0.293	<DL
74	6A	2.54	<DL	0.559	0.25	419	0.277	<DL
74	6B	1.41	<DL	<DL	0.516	442	0.438	<DL
74	6C	<DL	<DL	<DL	0.296	733	<DL	<DL
74	6D	<DL	<DL	<DL	0.146	364	<DL	<DL
74	6E	1	<DL	<DL	1.21	70.4	0.204	<DL
74	6F	1.11	<DL	<DL	0.716	138	0.281	<DL
74	BCAL	<DL	<DL	<DL	<DL	125	<DL	n.d.
74	BDOL	<DL	<DL	<DL	<DL	48.7	<DL	n.d.
74	R5	<DL	<DL	<DL	<DL	78.1	<DL	<DL
77	1A	1	<DL	0.454	<DL	222	0.227	n.d.
77	1B	2.68	<DL	0.415	0.481	334	0.618	n.d.
77	1C	<DL	<DL	<DL	0.161	209	0.185	n.d.
77	1D	<DL	<DL	<DL	0.45	1020	0.214	n.d.
77	1E	1.03	<DL	<DL	0.669	58	0.217	n.d.
77	1F	1.22	<DL	<DL	0.914	130	0.392	n.d.
77	2A	1.46	<DL	0.567	0.101	94.8	0.213	n.d.
77	2B	2.63	<DL	0.556	0.345	236	0.508	n.d.
77	2C	<DL	<DL	<DL	0.193	159	0.15	n.d.
77	2D	1.02	<DL	<DL	0.561	658	0.287	n.d.
77	2E	1.03	<DL	<DL	1.07	74.4	0.233	n.d.
77	2F	1.24	<DL	<DL	1.3	347	0.46	n.d.
77	3A	1.64	<DL	0.502	0.0933	67.5	0.274	n.d.
77	3B	1.08	<DL	<DL	0.351	198	0.405	n.d.
77	3C	<DL	<DL	<DL	0.183	353	0.136	n.d.
77	3D	<DL	<DL	<DL	0.48	793	0.218	n.d.
77	3E	1.21	<DL	<DL	1.12	99.8	0.321	n.d.
77	3F	1.3	<DL	<DL	0.876	133	0.381	n.d.
77	4A	1.2	<DL	0.51	0.0937	1270	0.261	n.d.
77	4B	<DL	<DL	<DL	0.473	339	0.311	n.d.
77	4C	<DL	<DL	<DL	0.241	671	0.108	n.d.

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
77	4D	1.04	<DL	<DL	0.419	1000	0.14	n.d.
77	4E	1.02	<DL	<DL	1.03	71.4	0.235	n.d.
77	4F	1.09	<DL	<DL	0.815	160	0.319	n.d.
77	5A	1.41	<DL	0.69	0.0845	385	0.178	n.d.
77	5B	1.77	<DL	<DL	0.587	456	0.489	n.d.
77	5C	<DL	<DL	<DL	0.224	353	0.107	n.d.
77	5D	<DL	<DL	<DL	0.514	911	0.125	n.d.
77	5E	1.08	<DL	<DL	1.32	125	0.245	n.d.
77	5F	1.1	<DL	<DL	0.967	137	0.341	n.d.
77	6A	1.93	<DL	<DL	0.232	263	0.29	n.d.
77	6B	1.36	<DL	<DL	0.482	392	0.508	n.d.
77	6C	<DL	<DL	<DL	0.244	729	0.12	n.d.
77	6D	<DL	<DL	<DL	0.149	270	0.124	n.d.
77	6E	1.05	<DL	<DL	1.15	80.3	0.275	n.d.
77	6F	1.02	<DL	<DL	0.812	123	0.329	n.d.
77	BCAL	<DL	<DL	<DL	<DL	85.9	<DL	n.d.
77	BDOL	<DL	<DL	<DL	<DL	48.4	<DL	n.d.
77	R6	<DL	<DL	<DL	<DL	82.8	<DL	n.d.
82	1A	1.11	<DL	0.433	<DL	197	0.239	<DL
82	1B	2.54	<DL	0.423	0.496	407	0.632	<DL
82	1C	<DL	<DL	<DL	0.172	242	0.347	<DL
82	1D	1.46	<DL	<DL	0.467	821	0.257	<DL
82	1E	1.18	<DL	<DL	0.721	62.6	0.216	<DL
82	1F	1.25	<DL	<DL	0.86	74.5	0.376	<DL
82	2A	1.42	<DL	0.498	0.0885	111	0.195	<DL
82	2B	2.53	<DL	0.559	0.355	296	0.483	<DL
82	2C	<DL	<DL	<DL	0.219	199	0.157	<DL
82	2D	n.d.	n.d.	n.d.	0.747	811.5	0.5085	<DL
82	2E	1.08	<DL	<DL	1.37	91.5	0.252	<DL
82	2F	1.19	<DL	<DL	1.44	152	0.406	<DL
82	3A	1.41	<DL	0.435	0.0861	75.3	0.23	<DL
82	3B	<DL	<DL	<DL	0.337	195	0.35	<DL
82	3C	<DL	<DL	<DL	0.184	338	0.131	<DL
82	3D	<DL	<DL	<DL	0.502	617	0.251	<DL
82	3E	1.01	<DL	<DL	1.17	102	0.31	<DL
82	3F	1.1	<DL	<DL	1.04	106	0.37	<DL
82	4A	<DL	<DL	<DL	<DL	300	0.151	<DL
82	4B	<DL	<DL	<DL	0.48	383	0.319	<DL
82	4C	<DL	<DL	<DL	0.262	650	0.112	<DL
82	4D	<DL	<DL	<DL	0.402	1050	0.172	<DL
82	4E	<DL	<DL	<DL	1.2	72.2	0.24	<DL
82	4F	1	<DL	<DL	1.05	131	0.312	<DL

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
82	5A	1.72	<DL	0.42	0.0669	95.8	0.242	<DL
82	5B	1.77	<DL	<DL	0.577	401	0.476	<DL
82	5C	<DL	<DL	<DL	0.3	389	0.104	<DL
82	5D	<DL	<DL	<DL	0.566	960	0.121	<DL
82	5E	<DL	<DL	<DL	1.72	109	0.242	<DL
82	5F	1.01	<DL	<DL	1.21	129	0.351	<DL
82	6A	<DL	<DL	<DL	0.305	410	0.203	<DL
82	6B	1.38	<DL	<DL	0.505	382	0.493	<DL
82	6C	<DL	<DL	<DL	0.305	633	0.122	<DL
82	6D	<DL	<DL	<DL	0.208	257	0.127	<DL
82	6E	1.06	<DL	<DL	1.45	90.2	0.292	<DL
82	6F	<DL	<DL	<DL	0.977	104	0.324	<DL
82	BCAL	<DL	<DL	<DL	<DL	91.2	<DL	n.d.
82	BDOL	<DL	<DL	<DL	<DL	54.5	<DL	n.d.
82	R1	<DL	<DL	<DL	<DL	72.6	<DL	n.d.
84	1A	1.67	<DL	0.606	0.0807	172	0.263	n.d.
84	1B	3.62	<DL	0.465	0.562	339	0.643	n.d.
84	1C	1.06	<DL	<DL	0.195	280	2.91	n.d.
84	1D	1.23	<DL	<DL	0.535	869	0.134	n.d.
84	1E	1.66	<DL	<DL	0.955	58.2	0.17	n.d.
84	1F	1.73	<DL	<DL	0.949	70.9	0.339	n.d.
84	2A	2.13	<DL	0.632	0.106	75.2	0.183	n.d.
84	2B	3.64	<DL	0.672	0.365	234	0.485	n.d.
84	2C	<DL	<DL	<DL	0.236	233	<DL	n.d.
84	2D	1.51	<DL	<DL	0.665	662	0.688	n.d.
84	2E	1.58	<DL	<DL	1.49	86.8	0.178	n.d.
84	2F	1.76	<DL	<DL	1.62	168	0.38	n.d.
84	3A	2.56	<DL	0.687	0.133	67.2	0.279	n.d.
84	3B	1.44	<DL	<DL	0.383	171	0.33	n.d.
84	3C	<DL	<DL	<DL	0.208	334	<DL	n.d.
84	3D	1.15	<DL	<DL	0.503	436	0.146	n.d.
84	3E	1.64	<DL	<DL	1.28	89.2	0.271	n.d.
84	3F	1.83	<DL	<DL	1.27	117	0.338	n.d.
84	4A	1.07	<DL	<DL	0.0861	488	0.167	n.d.
84	4B	1.17	<DL	<DL	0.467	302	0.288	n.d.
84	4C	<DL	<DL	<DL	0.315	708	<DL	n.d.
84	4D	1.11	<DL	<DL	0.428	1020	<DL	n.d.
84	4E	1.54	<DL	<DL	1.3	65.3	0.182	n.d.
84	4F	1.66	<DL	<DL	1.13	130	0.271	n.d.
84	5A	2.42	<DL	0.766	0.127	250	0.171	n.d.
84	5B	2.34	<DL	<DL	0.551	334	0.471	n.d.
84	5C	1.15	<DL	<DL	0.307	404	<DL	n.d.

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
84	5D	1.2	<DL	<DL	0.578	935	<DL	n.d.
84	5E	1.59	<DL	<DL	1.89	99.4	0.201	n.d.
84	5F	1.62	<DL	<DL	1.25	120	0.303	n.d.
84	6A	3.2	<DL	0.496	0.387	609	0.381	n.d.
84	6B	2.15	<DL	<DL	0.508	312	0.492	n.d.
84	6C	1.08	<DL	<DL	0.277	631	<DL	n.d.
84	6D	<DL	<DL	<DL	0.211	226	<DL	n.d.
84	6E	1.85	<DL	<DL	1.61	76.9	0.25	n.d.
84	6F	1.73	<DL	<DL	0.993	94.1	0.343	n.d.
84	BCAL	<DL	<DL	<DL	<DL	91	<DL	n.d.
84	BDOL	<DL	<DL	<DL	<DL	34.4	<DL	n.d.
84	R2	<DL	<DL	<DL	<DL	38.6	<DL	n.d.
88	1A	1.78	<DL	0.565	0.0755	466	0.23	<DL
88	1B	3.18	<DL	0.46	0.506	298	0.601	<DL
88	1C	1.04	<DL	<DL	0.218	317	0.126	<DL
88	1D	1.71	<DL	<DL	0.606	2210	0.16	<DL
88	1E	1.56	<DL	<DL	1.12	64.5	0.183	<DL
88	1F	1.75	<DL	<DL	1.02	227	0.309	<DL
88	2A	2.16	<DL	0.585	0.111	90.3	0.191	<DL
88	2B	3.57	<DL	0.571	0.332	193	0.481	<DL
88	2C	1.04	<DL	<DL	0.256	237	0.109	<DL
88	2D	2.13	n.d.	n.d.	0.963	847.5	0.513	<DL
88	2E	1.67	<DL	<DL	2.08	98.6	0.206	<DL
88	2F	1.81	<DL	<DL	1.88	515	0.403	<DL
88	3A	2.21	<DL	0.54	0.119	65.6	0.231	<DL
88	3B	1.35	<DL	<DL	0.385	178	0.335	<DL
88	3C	<DL	<DL	<DL	0.209	328	<DL	<DL
88	3D	n.d.	n.d.	n.d.	0.5985	14895	0.2055	<DL
88	3E	1.57	<DL	<DL	1.31	93.6	0.273	<DL
88	3F	1.81	<DL	<DL	1.55	361	0.341	<DL
88	4A	n.d.	n.d.	n.d.	0.10935	2490	0.1875	<DL
88	4B	1.27	<DL	<DL	0.498	296	0.272	<DL
88	4C	<DL	<DL	<DL	0.273	569	<DL	<DL
88	4D	1.57	<DL	<DL	0.431	1530	<DL	<DL
88	4E	1.82	<DL	<DL	1.36	65	0.197	<DL
88	4F	1.84	<DL	<DL	1.56	395	0.299	0.057
88	5A	2.65	<DL	0.925	0.134	1320	0.187	<DL
88	5B	2.7	<DL	0.454	0.603	357	0.506	<DL
88	5C	1.36	<DL	<DL	0.33	388	<DL	<DL
88	5D	1.39	<DL	<DL	0.547	1080	<DL	<DL
88	5E	1.71	<DL	<DL	2.01	98.8	0.208	<DL
88	5F	1.87	<DL	<DL	1.55	271	0.334	<DL

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
88	6A	4.21	<DL	0.608	0.418	1270	0.415	<DL
88	6B	2.15	<DL	<DL	0.544	333	0.477	<DL
88	6C	1.22	<DL	<DL	0.282	634	<DL	<DL
88	6D	1.05	<DL	<DL	0.251	361	<DL	<DL
88	6E	1.74	<DL	<DL	1.87	85.7	0.26	<DL
88	6F	1.65	<DL	<DL	1.28	237	0.308	<DL
88	BCAL	<DL	<DL	<DL	<DL	141	<DL	n.d.
88	BDOL	<DL	<DL	<DL	<DL	55.6	<DL	n.d.
88	R3	<DL	<DL	<DL	<DL	48.4	<DL	n.d.
91	1A	1.61	<DL	0.605	0.101	616	0.33	n.d.
91	1B	2.69	<DL	<DL	0.409	276	0.641	n.d.
91	1C	<DL	<DL	<DL	0.207	334	0.215	n.d.
91	1D	1.31	<DL	<DL	0.472	1270	0.239	n.d.
91	1E	1.43	<DL	<DL	1.05	82.9	0.286	n.d.
91	1F	1.49	<DL	<DL	0.853	192	0.4	n.d.
91	2A	1.79	<DL	0.501	0.102	97.9	0.258	n.d.
91	2B	2.93	<DL	0.451	0.315	180	0.542	n.d.
91	2C	<DL	<DL	<DL	0.267	235	0.179	n.d.
91	2D	2.115	n.d.	n.d.	1.029	1017	0.5115	n.d.
91	2E	1.36	<DL	<DL	2	104	0.268	n.d.
91	2F	1.46	<DL	<DL	1.76	335	0.47	n.d.
91	3A	1.71	<DL	0.54	0.0851	67.3	0.323	n.d.
91	3B	1.48	<DL	<DL	0.34	179	0.427	n.d.
91	3C	1.07	<DL	<DL	0.202	315	0.185	n.d.
91	3D	<DL	<DL	<DL	0.31	225	0.208	n.d.
91	3E	1.59	<DL	<DL	1.34	101	0.356	n.d.
91	3F	1.9	<DL	<DL	1.4	303	0.516	n.d.
91	4A	<DL	<DL	<DL	<DL	654	0.196	n.d.
91	4B	1.14	<DL	<DL	0.447	290	0.372	n.d.
91	4C	1.01	<DL	<DL	0.258	516	0.183	n.d.
91	4D	1.15	<DL	<DL	0.367	1150	0.198	n.d.
91	4E	1.45	<DL	<DL	1.42	84	0.277	n.d.
91	4F	1.73	<DL	<DL	1.67	299	0.447	n.d.
91	5A	2.19	<DL	0.811	0.101	1010	0.273	n.d.
91	5B	2.33	<DL	<DL	0.527	312	0.607	n.d.
91	5C	1.27	<DL	<DL	0.278	364	0.166	n.d.
91	5D	1.24	<DL	<DL	0.44	808	0.159	n.d.
91	5E	1.56	<DL	<DL	1.91	113	0.303	n.d.
91	5F	1.6	<DL	<DL	1.45	247	0.417	n.d.
91	6A	2.97	<DL	<DL	0.488	945	0.505	n.d.
91	6B	1.76	<DL	<DL	0.485	313	0.552	n.d.
91	6C	1.06	<DL	<DL	0.292	553	0.168	n.d.

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
91	6D	1.12	<DL	<DL	0.243	297	0.154	n.d.
91	6E	1.53	<DL	<DL	1.73	92.5	0.376	n.d.
91	6F	1.6	<DL	<DL	1.34	221	0.399	n.d.
91	BCAL	<DL	<DL	<DL	<DL	135	<DL	n.d.
91	BDOL	<DL	<DL	<DL	<DL	64.1	<DL	n.d.
91	R4	<DL	<DL	<DL	<DL	48.8	<DL	n.d.
95	1A	1.75	<DL	0.624	0.0981	737	0.327	<DL
95	1B	2.72	<DL	<DL	0.441	292	0.659	<DL
95	1C	1.01	<DL	<DL	0.252	377	0.227	<DL
95	1D	1.55	<DL	<DL	0.578	1630	0.267	<DL
95	1E	1.74	<DL	<DL	1.41	99.6	0.29	<DL
95	1F	1.86	<DL	<DL	1.26	226	0.423	<DL
95	2A	1.84	<DL	0.53	0.0931	105	0.259	<DL
95	2B	3.43	<DL	0.521	0.305	194	0.591	<DL
95	2C	1.08	<DL	<DL	0.298	288	0.202	<DL
95	2D	1.905	n.d.	n.d.	0.789	846	0.4395	<DL
95	2E	1.7	<DL	<DL	2.31	117	0.332	<DL
95	2F	1.69	<DL	<DL	1.96	404	0.516	0.057
95	3A	1.83	<DL	0.509	0.0871	73.9	0.31	<DL
95	3B	1.4	<DL	<DL	0.317	184	0.424	<DL
95	3C	<DL	<DL	<DL	0.159	312	0.175	<DL
95	3D	n.d.	n.d.	n.d.	0.4335	279	0.432	<DL
95	3E	1.45	<DL	<DL	1.26	97.7	0.356	<DL
95	3F	1.75	<DL	<DL	1.67	397	0.465	0.0855
95	4A	1.38	<DL	0.579	0.11	1700	0.309	0.057
95	4B	1.2	<DL	<DL	0.474	296	0.38	<DL
95	4C	1.16	<DL	<DL	0.241	503	0.231	<DL
95	4D	1.17	<DL	<DL	0.37	1220	0.21	<DL
95	4E	1.71	<DL	<DL	1.39	83.7	0.31	<DL
95	4F	1.61	<DL	<DL	1.71	350	0.392	0.057
95	5A	1.8	n.d.	0.7935	n.d.	1090.5	0.285	<DL
95	5B	2.36	<DL	0.577	0.567	305	0.631	<DL
95	5C	1.26	<DL	<DL	0.283	350	0.169	<DL
95	5D	1.23	<DL	<DL	0.407	791	0.164	<DL
95	5E	1.62	<DL	<DL	2.14	108	0.31	<DL
95	5F	1.67	<DL	<DL	1.68	276	0.484	0.057
95	6A	n.d.	n.d.	n.d.	0.2865	1290	0.3165	<DL
95	6B	1.92	<DL	<DL	0.486	332	0.692	<DL
95	6C	1.15	<DL	<DL	0.289	537	0.188	<DL
95	6D	1.12	<DL	<DL	0.214	337	0.219	<DL
95	6E	1.6	<DL	<DL	1.76	95.4	0.366	<DL
95	6F	1.59	<DL	<DL	1.61	265	0.436	0.057

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Ti μg/L 1	Tl μg/L 0.6	V μg/L 0.4	Y μg/L 0.06	Zn μg/L 1	Zr μg/L 0.1	F- mg/L 0.029
95	BCAL	<DL	<DL	<DL	<DL	137	<DL	n.d.
95	BDOL	<DL	<DL	<DL	<DL	69.9	<DL	n.d.
95	R5	<DL	<DL	<DL	<DL	66	<DL	n.d.
98	1A	1.85	<DL	0.778	0.114	398	0.305	n.d.
98	1B	2.68	<DL	0.471	0.462	299	0.566	n.d.
98	1C	1.23	<DL	<DL	0.277	505	0.136	n.d.
98	1D	1.25	<DL	<DL	0.528	1000	0.177	n.d.
98	1E	1.66	<DL	<DL	1.79	124	0.176	n.d.
98	1F	1.58	<DL	<DL	1.42	161	0.312	n.d.
98	2A	1.96	<DL	0.704	0.103	107	0.156	n.d.
98	2B	3.3	<DL	0.688	0.327	192	0.483	n.d.
98	2C	1.14	<DL	<DL	0.309	365	<DL	n.d.
98	2D	1.545	n.d.	n.d.	0.6615	811.5	0.267	n.d.
98	2E	1.51	<DL	<DL	2.31	130	0.198	n.d.
98	2F	1.48	<DL	<DL	2.01	182	0.421	n.d.
98	3A	1.85	<DL	0.578	0.107	80.5	0.202	n.d.
98	3B	1.31	<DL	<DL	0.36	201	0.305	n.d.
98	3C	<DL	<DL	<DL	0.188	380	<DL	n.d.
98	3D	n.d.	n.d.	n.d.	0.348	298.5	0.1605	n.d.
98	3E	1.28	<DL	<DL	1.21	113	0.242	n.d.
98	3F	1.54	<DL	<DL	1.7	241	0.377	n.d.
98	4A	<DL	<DL	<DL	0.0646	515	0.116	n.d.
98	4B	1.02	<DL	<DL	0.461	306	0.277	n.d.
98	4C	<DL	<DL	<DL	0.256	611	<DL	n.d.
98	4D	<DL	<DL	<DL	0.415	993	<DL	n.d.
98	4E	1.37	<DL	<DL	1.43	94.3	0.171	n.d.
98	4F	1.36	<DL	<DL	1.99	205	0.288	n.d.
98	5A	1.26	<DL	0.76	0.0952	235	<DL	n.d.
98	5B	2.1	<DL	<DL	0.555	298	0.472	n.d.
98	5C	<DL	<DL	<DL	0.253	389	<DL	n.d.
98	5D	1.12	<DL	<DL	0.409	736	<DL	n.d.
98	5E	1.34	<DL	<DL	1.93	123	0.17	n.d.
98	5F	1.53	<DL	<DL	1.92	200	0.336	n.d.
98	6A	1.88	<DL	<DL	0.343	278	0.232	n.d.
98	6B	1.92	<DL	<DL	0.481	368	0.442	n.d.
98	6C	1.14	<DL	<DL	0.278	640	<DL	n.d.
98	6D	<DL	<DL	<DL	0.219	277	<DL	n.d.
98	6E	1.69	<DL	<DL	1.85	112	0.242	n.d.
98	6F	1.51	<DL	<DL	1.82	177	0.316	n.d.
98	BCAL	<DL	<DL	<DL	<DL	143	<DL	n.d.
98	BDOL	<DL	<DL	<DL	<DL	86.8	0.129	n.d.
98	R6	<DL	<DL	<DL	<DL	55.1	<DL	n.d.

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
103	1A	1.63	<DL	0.699	0.0858	882	0.217	<DL
103	1B	2.55	<DL	0.515	0.454	338	0.543	<DL
103	1C	1.08	<DL	<DL	0.295	505	0.123	<DL
103	1D	n.d.	n.d.	n.d.	0.471	3630	n.d.	<DL
103	1E	1.44	<DL	<DL	1.97	148	0.165	<DL
103	1F	1.49	<DL	<DL	1.8	366	0.323	0.057
103	2A	1.94	<DL	0.749	0.103	133	0.156	<DL
103	2B	3	<DL	0.611	0.272	202	0.435	<DL
103	2C	<DL	<DL	<DL	0.277	362	<DL	<DL
103	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
103	2E	1.39	<DL	<DL	2.74	136	0.176	<DL
103	2F	1.42	<DL	<DL	2.29	471	0.37	0.057
103	3A	1.34	<DL	0.513	0.073	71.1	0.128	<DL
103	3B	1.19	<DL	<DL	0.354	230	0.292	<DL
103	3C	<DL	<DL	<DL	0.18	407	<DL	<DL
103	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
103	3E	1.31	<DL	<DL	1.34	130	0.233	<DL
103	3F	1.53	<DL	<DL	2.14	498	0.398	0.114
103	4A	n.d.	n.d.	n.d.	n.d.	2850	n.d.	<DL
103	4B	1.01	<DL	<DL	0.503	354	0.26	<DL
103	4C	<DL	<DL	<DL	0.263	568	<DL	<DL
103	4D	1.35	<DL	<DL	0.367	1840	0.113	<DL
103	4E	1.6	<DL	<DL	1.54	100	0.145	<DL
103	4F	1.67	<DL	<DL	1.97	462	0.301	0.057
103	5A	1.68	<DL	0.826	0.0752	1450	0.104	<DL
103	5B	2.2	<DL	<DL	0.535	327	0.48	<DL
103	5C	1.17	<DL	<DL	0.24	373	<DL	<DL
103	5D	1.27	<DL	<DL	0.354	1040	<DL	<DL
103	5E	1.46	<DL	<DL	2.03	123	0.166	<DL
103	5F	1.55	<DL	<DL	2.04	411	0.328	0.057
103	6A	1.37	<DL	<DL	0.353	881	0.179	0.2
103	6B	1.75	<DL	<DL	0.513	380	0.423	<DL
103	6C	<DL	<DL	<DL	0.253	584	<DL	<DL
103	6D	<DL	<DL	<DL	0.245	585	<DL	<DL
103	6E	1.45	<DL	<DL	2.01	112	0.236	<DL
103	6F	1.56	<DL	<DL	2.06	379	0.332	0.057
103	BCAL	<DL	<DL	<DL	<DL	265	<DL	n.d.
103	BDOL	<DL	<DL	<DL	<DL	99.7	<DL	n.d.
103	R1	<DL	<DL	<DL	<DL	95.5	<DL	n.d.
105	1A	2.1	<DL	0.689	0.108	580	0.418	n.d.
105	1B	2.49	<DL	<DL	0.399	250	0.651	n.d.
105	1C	1.22	<DL	<DL	0.288	492	0.253	n.d.

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
105	1D	1.18	<DL	<DL	0.516	1120	0.255	n.d.
105	1E	1.44	<DL	<DL	1.77	122	0.27	n.d.
105	1F	1.52	<DL	<DL	1.6	199	0.434	n.d.
105	2A	1.93	<DL	0.577	0.105	86.2	0.28	n.d.
105	2B	3.51	<DL	0.568	0.315	174	0.614	n.d.
105	2C	<DL	<DL	<DL	0.269	309	0.204	n.d.
105	2D	1.6	<DL	<DL	0.743	732	0.589	n.d.
105	2E	1.41	<DL	<DL	2.33	112	0.282	n.d.
105	2F	1.74	<DL	<DL	2.33	292	0.541	n.d.
105	3A	1.66	<DL	0.42	0.0652	52.1	0.272	n.d.
105	3B	1.55	<DL	<DL	0.289	173	0.412	n.d.
105	3C	<DL	<DL	<DL	0.146	354	0.248	n.d.
105	3D	1.24	<DL	<DL	0.428	311	0.363	n.d.
105	3E	1.53	<DL	<DL	1.09	105	0.34	n.d.
105	3F	1.69	<DL	<DL	1.85	250	0.489	n.d.
105	4A	1.33	<DL	0.406	0.0994	916	0.505	n.d.
105	4B	1.13	<DL	<DL	0.416	267	0.363	n.d.
105	4C	<DL	<DL	<DL	0.241	500	0.161	n.d.
105	4D	<DL	<DL	<DL	0.362	863	0.169	n.d.
105	4E	1.34	<DL	<DL	1.37	85.7	0.258	n.d.
105	4F	1.46	<DL	<DL	1.88	375	0.384	n.d.
105	5A	1.75	<DL	0.752	0.0768	511	0.239	n.d.
105	5B	1.94	<DL	<DL	0.457	224	0.566	n.d.
105	5C	1.12	<DL	<DL	0.219	342	0.166	n.d.
105	5D	1.1	<DL	<DL	0.284	628	0.16	n.d.
105	5E	1.37	<DL	<DL	1.7	102	0.272	n.d.
105	5F	1.47	<DL	<DL	1.75	207	0.42	n.d.
105	6A	2.06	<DL	<DL	0.263	296	0.341	n.d.
105	6B	1.65	<DL	<DL	0.446	284	0.515	n.d.
105	6C	1.06	<DL	<DL	0.256	554	0.172	n.d.
105	6D	<DL	<DL	<DL	0.222	329	0.171	n.d.
105	6E	1.42	<DL	<DL	1.65	94.6	0.332	n.d.
105	6F	1.35	<DL	<DL	1.8	195	0.447	n.d.
105	BCAL	<DL	<DL	<DL	<DL	132	<DL	n.d.
105	BDOL	<DL	<DL	<DL	<DL	56.9	<DL	n.d.
105	R2	<DL	<DL	<DL	<DL	37.5	<DL	n.d.
109	1A	1.36	<DL	0.452	0.0636	321	1.12	<DL
109	1B	2.2	<DL	<DL	0.368	248	0.665	<DL
109	1C	n.d.	n.d.	n.d.	0.2085	394.5	0.2535	<DL
109	1D	1.33	<DL	<DL	0.434	1440	0.262	<DL
109	1E	1.57	<DL	<DL	1.83	124	0.272	<DL
109	1F	1.73	<DL	<DL	1.79	280	0.436	0.0855

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
109	2A	1.93	<DL	0.494	0.102	88.8	0.271	<DL
109	2B	3.12	<DL	0.492	0.264	169	0.54	<DL
109	2C	1.06	<DL	<DL	0.243	307	0.205	<DL
109	2D	n.d.	n.d.	n.d.	0.5655	777	0.522	n.d.
109	2E	1.5	<DL	<DL	2.27	116	0.294	<DL
109	2F	1.57	<DL	<DL	2.13	374	0.495	0.057
109	3A	1.15	<DL	<DL	<DL	51.5	0.244	<DL
109	3B	1.22	<DL	<DL	0.306	180	0.391	<DL
109	3C	<DL	<DL	<DL	0.166	367	0.168	<DL
109	3D	<DL	<DL	<DL	0.395	270	0.212	<DL
109	3E	1.25	<DL	<DL	1.22	108	0.323	<DL
109	3F	1.63	<DL	<DL	2.21	334	0.483	0.143
109	4A	1.02	<DL	<DL	0.0748	794	0.249	<DL
109	4B	1.05	<DL	<DL	0.415	273	0.361	<DL
109	4C	<DL	<DL	<DL	0.218	479	0.164	<DL
109	4D	<DL	<DL	<DL	0.347	1100	0.192	<DL
109	4E	1.23	<DL	<DL	1.41	91.4	0.266	<DL
109	4F	1.41	<DL	<DL	1.7	340	0.387	0.076
109	5A	1.68	n.d.	n.d.	n.d.	987	0.2775	<DL
109	5B	1.92	<DL	<DL	0.465	227	0.546	<DL
109	5C	1.08	<DL	<DL	0.218	315	0.159	<DL
109	5D	1.03	<DL	<DL	0.273	722	0.166	<DL
109	5E	1.34	<DL	<DL	1.86	102	0.273	<DL
109	5F	1.34	<DL	<DL	1.9	345	0.423	0.105
109	6A	2.31	<DL	<DL	0.272	613	0.37	<DL
109	6B	1.55	<DL	<DL	0.435	304	0.545	<DL
109	6C	<DL	<DL	<DL	0.225	487	0.173	<DL
109	6D	<DL	<DL	<DL	0.214	363	0.169	<DL
109	6E	1.44	<DL	<DL	1.65	96	0.333	<DL
109	6F	1.36	<DL	<DL	1.78	261	0.407	0.076
109	BCAL	<DL	<DL	<DL	<DL	110	<DL	n.d.
109	BDOL	<DL	<DL	<DL	<DL	69.3	<DL	n.d.
109	R3	<DL	<DL	<DL	<DL	46.8	<DL	n.d.
112	1A	2.74	<DL	0.746	0.145	923	0.371	n.d.
112	1B	2.78	<DL	<DL	0.417	248	0.607	n.d.
112	1C	1.31	<DL	<DL	0.266	416	0.178	n.d.
112	1D	1.36	<DL	<DL	0.548	1420	0.224	n.d.
112	1E	1.68	<DL	<DL	2.1	128	0.244	n.d.
112	1F	1.85	<DL	<DL	2.14	272	0.444	n.d.
112	2A	2.24	<DL	0.586	0.0998	85	0.231	n.d.
112	2B	3.28	<DL	0.513	0.312	219	0.507	n.d.
112	2C	1.23	<DL	<DL	0.28	340	0.152	n.d.

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
112	2D	1.43	<DL	<DL	0.628	788	0.416	n.d.
112	2E	1.55	<DL	<DL	2.3	102	0.236	n.d.
112	2F	1.78	<DL	<DL	2.21	340	0.468	n.d.
112	3A	1.64	<DL	0.432	0.0754	56.5	0.212	n.d.
112	3B	1.37	<DL	<DL	0.324	165	0.395	n.d.
112	3C	<DL	<DL	<DL	0.173	381	0.112	n.d.
112	3D	1.04	<DL	<DL	0.322	293	0.168	n.d.
112	3E	1.36	<DL	<DL	1.25	105	0.271	n.d.
112	3F	1.75	<DL	<DL	2.16	307	0.489	n.d.
112	4A	<DL	<DL	<DL	<DL	298	0.126	n.d.
112	4B	1.31	<DL	<DL	0.487	292	0.391	n.d.
112	4C	<DL	<DL	<DL	0.223	491	0.103	n.d.
112	4D	1.17	<DL	<DL	0.373	987	0.141	n.d.
112	4E	1.51	<DL	<DL	1.58	92.2	0.226	n.d.
112	4F	1.52	<DL	<DL	1.7	303	0.36	n.d.
112	5A	2.33	<DL	0.615	0.104	823	0.251	n.d.
112	5B	2.17	<DL	<DL	0.499	225	0.568	n.d.
112	5C	1.21	<DL	<DL	0.222	320	0.13	n.d.
112	5D	1.22	<DL	<DL	0.303	643	0.106	n.d.
112	5E	1.45	<DL	<DL	1.71	91	0.23	n.d.
112	5F	1.48	<DL	<DL	1.83	283	0.388	n.d.
112	6A	1.94	<DL	<DL	0.278	459	0.274	n.d.
112	6B	2.07	<DL	<DL	0.459	274	0.507	n.d.
112	6C	1.18	<DL	<DL	0.222	474	0.157	n.d.
112	6D	1.22	<DL	<DL	0.219	381	0.119	n.d.
112	6E	1.68	<DL	<DL	1.77	90.6	0.304	n.d.
112	6F	1.72	<DL	<DL	1.88	233	0.398	n.d.
112	BCAL	<DL	<DL	<DL	<DL	141	<DL	n.d.
112	BDOL	<DL	<DL	<DL	<DL	50.3	<DL	n.d.
112	R4	<DL	<DL	<DL	<DL	33.1	<DL	n.d.
116	1A	1.54	<DL	0.559	0.0634	479	0.244	<DL
116	1B	2.46	<DL	<DL	0.373	254	0.581	<DL
116	1C	1.12	<DL	<DL	0.218	407	0.178	<DL
116	1D	1.21	<DL	<DL	0.519	1040	0.242	<DL
116	1E	1.52	<DL	<DL	2.15	133	0.218	0.057
116	1F	1.61	<DL	<DL	2.05	203	0.416	0.228
116	2A	1.52	<DL	0.555	0.0742	65.8	0.181	<DL
116	2B	3.03	<DL	0.454	0.246	175	0.504	<DL
116	2C	1.08	<DL	<DL	0.263	358	0.153	<DL
116	2D	1.16	<DL	<DL	0.462	635	0.463	n.d.
116	2E	1.43	<DL	<DL	2.33	106	0.238	0.0855
116	2F	<DL	<DL	<DL	2.14	220	0.384	0.171

Table 13: cont

		Element, Unit, Detection Limit						
Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
116	3A	1	<DL	<DL	<DL	44.5	0.178	<DL
116	3B	1.25	<DL	<DL	0.317	176	0.361	<DL
116	3C	<DL	<DL	<DL	0.171	398	0.122	<DL
116	3D	<DL	<DL	<DL	0.353	312	0.176	<DL
116	3E	1.26	<DL	<DL	1.24	109	0.259	0.057
116	3F	1.78	<DL	<DL	2.31	269	0.516	0.399
116	4A	<DL	<DL	<DL	<DL	282	<DL	<DL
116	4B	1.17	<DL	<DL	0.451	299	0.337	<DL
116	4C	<DL	<DL	<DL	0.218	488	0.111	<DL
116	4D	<DL	<DL	<DL	0.296	792	0.125	<DL
116	4E	1.8	<DL	<DL	1.44	91.9	0.218	<DL
116	4F	1.64	<DL	<DL	1.63	315	0.346	0.171
116	5A	2.37	<DL	0.585	0.0823	929	0.215	<DL
116	5B	2.25	<DL	<DL	0.441	229	0.549	<DL
116	5C	1.19	<DL	<DL	0.183	311	0.112	<DL
116	5D	1.29	<DL	<DL	0.254	569	0.104	<DL
116	5E	1.5	<DL	<DL	1.58	90.8	0.215	0.057
116	5F	1.6	<DL	<DL	1.82	307	0.403	0.171
116	6A	1.03	<DL	<DL	0.217	333	0.22	<DL
116	6B	1.75	<DL	<DL	0.4	265	0.497	<DL
116	6C	1.04	<DL	<DL	0.181	447	0.117	<DL
116	6D	<DL	<DL	<DL	0.2	400	0.116	0.114
116	6E	1.42	<DL	<DL	1.68	87.6	0.296	0.057
116	6F	1.48	<DL	<DL	1.86	252	0.38	0.143
116	BCAL	<DL	<DL	<DL	<DL	119	<DL	n.d.
116	BDOL	<DL	<DL	<DL	<DL	67.5	<DL	n.d.
116	R5	<DL	<DL	<DL	<DL	45.4	<DL	n.d.
119	1A	1.75	<DL	0.544	0.091	603	0.31	n.d.
119	1B	2.56	<DL	<DL	0.393	252	0.576	n.d.
119	1C	1.21	<DL	<DL	0.242	421	0.186	n.d.
119	1D	1.21	<DL	<DL	0.523	1100	0.207	n.d.
119	1E	1.55	<DL	<DL	1.96	134	0.222	n.d.
119	1F	1.7	<DL	<DL	2.03	270	0.422	n.d.
119	2A	1.88	<DL	0.546	0.0924	73.8	0.228	n.d.
119	2B	3.36	<DL	0.504	0.263	152	0.512	n.d.
119	2C	1.1	<DL	<DL	0.253	348	0.15	n.d.
119	2D	1.43	<DL	<DL	0.644	788	0.477	n.d.
119	2E	1.54	<DL	<DL	2.38	108	0.241	n.d.
119	2F	1.49	<DL	<DL	2.36	307	0.458	n.d.
119	3A	1.63	<DL	0.485	0.0708	52.7	0.222	n.d.
119	3B	1.63	<DL	<DL	0.312	165	0.374	n.d.
119	3C	1.08	<DL	<DL	0.154	389	0.121	n.d.

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
119	3D	1.24	<DL	<DL	0.452	325	0.163	n.d.
119	3E	1.56	<DL	<DL	1.17	129	0.265	n.d.
119	3F	1.83	<DL	<DL	2.28	316	0.481	n.d.
119	4A	<DL	<DL	<DL	<DL	301	0.13	n.d.
119	4B	1.27	<DL	<DL	0.436	262	0.331	n.d.
119	4C	1.09	<DL	<DL	0.231	530	0.107	n.d.
119	4D	1.15	<DL	<DL	0.344	993	0.129	n.d.
119	4E	1.41	<DL	<DL	1.43	91.5	0.211	n.d.
119	4F	1.49	<DL	<DL	1.88	364	0.348	n.d.
119	5A	1.94	<DL	0.578	0.0744	296	0.183	n.d.
119	5B	2.31	<DL	<DL	0.48	223	0.562	n.d.
119	5C	1.13	<DL	<DL	0.19	317	0.114	n.d.
119	5D	1.23	<DL	<DL	0.265	639	0.124	n.d.
119	5E	1.41	<DL	<DL	1.49	87.9	0.23	n.d.
119	5F	1.53	<DL	<DL	1.74	254	0.393	n.d.
119	6A	2.93	<DL	<DL	0.329	836	0.377	n.d.
119	6B	1.74	<DL	<DL	0.406	242	0.481	n.d.
119	6C	1.01	<DL	<DL	0.189	430	0.114	n.d.
119	6D	<DL	<DL	<DL	0.199	344	0.12	n.d.
119	6E	1.43	<DL	<DL	1.56	88.5	0.295	n.d.
119	6F	1.45	<DL	<DL	1.75	225	0.403	n.d.
119	BCAL	<DL	<DL	<DL	<DL	90.4	<DL	n.d.
119	BDOL	<DL	<DL	<DL	<DL	62.4	<DL	n.d.
119	R6	<DL	<DL	<DL	<DL	29.3	<DL	n.d.
123	1A	2.04	<DL	0.59	0.0913	944	0.328	<DL
123	1B	2.46	<DL	<DL	0.358	273	0.565	<DL
123	1C	<DL	<DL	<DL	0.22	402	0.175	<DL
123	1D	1.62	<DL	<DL	0.48	886	0.278	<DL
123	1E	1.77	<DL	<DL	1.69	136	0.215	0.114
123	1F	1.87	<DL	<DL	2.36	323	0.413	0.228
123	2A	2.47	<DL	0.601	0.103	84.5	0.271	<DL
123	2B	3.37	<DL	0.505	0.301	200	0.514	<DL
123	2C	1.14	<DL	<DL	0.2	318	0.139	<DL
123	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
123	2E	1.65	<DL	<DL	2.18	111	0.229	0.0855
123	2F	1.67	<DL	<DL	2.37	326	0.445	0.228
123	3A	1.65	<DL	0.456	0.0784	54	0.232	<DL
123	3B	1.39	<DL	<DL	0.304	185	0.375	<DL
123	3C	<DL	<DL	<DL	0.161	429	0.126	<DL
123	3D	1.09	<DL	<DL	0.382	337	0.214	<DL
123	3E	1.38	<DL	<DL	1.19	122	0.257	0.0855
123	3F	1.64	<DL	<DL	2.38	347	0.488	0.285

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
123	4A	<DL	<DL	<DL	<DL	681	0.177	<DL
123	4B	1.11	<DL	<DL	0.447	274	0.34	<DL
123	4C	<DL	<DL	<DL	0.21	517	0.102	<DL
123	4D	1.03	<DL	<DL	0.314	1020	0.146	<DL
123	4E	1.52	<DL	<DL	1.23	109	0.213	<DL
123	4F	1.33	<DL	<DL	1.63	993	0.355	0.152
123	5A	1.76	<DL	0.662	0.0742	1490	0.208	<DL
123	5B	2.22	<DL	<DL	0.434	224	0.549	<DL
123	5C	1.11	<DL	<DL	0.173	321	0.115	<DL
123	5D	1.22	<DL	<DL	0.267	830	0.17	<DL
123	5E	1.33	<DL	<DL	1.57	84.1	0.216	0.038
123	5F	1.41	<DL	<DL	1.72	305	0.377	0.124
123	6A	2.74	<DL	<DL	0.254	562	0.335	<DL
123	6B	1.64	<DL	<DL	0.417	249	0.487	<DL
123	6C	<DL	<DL	<DL	0.216	433	0.129	<DL
123	6D	1.06	<DL	<DL	0.213	387	0.135	<DL
123	6E	1.52	<DL	<DL	1.72	89.4	0.297	0.038
123	6F	1.4	<DL	<DL	1.59	247	0.372	0.124
123	BCAL	<DL	<DL	<DL	<DL	120	<DL	n.d.
123	BDOL	<DL	<DL	<DL	<DL	16	<DL	n.d.
123	R1	<DL	<DL	<DL	<DL	43.9	<DL	n.d.
126	1A	2.13	<DL	0.751	0.118	1360	0.905	n.d.
126	1B	2.59	<DL	<DL	0.383	256	0.869	n.d.
126	1C	1.22	<DL	<DL	0.254	425	0.514	n.d.
126	1D	1.33	<DL	<DL	0.487	1120	0.545	n.d.
126	1E	1.78	<DL	<DL	2.2	145	0.552	n.d.
126	1F	1.84	<DL	<DL	2.44	313	0.738	n.d.
126	2A	2.26	<DL	0.587	0.116	76.8	0.601	n.d.
126	2B	3.01	<DL	0.444	0.267	178	0.786	n.d.
126	2C	1.18	<DL	<DL	0.265	346	0.494	n.d.
126	2D	1.66	<DL	<DL	0.55	553	0.698	n.d.
126	2E	1.66	<DL	<DL	2.54	118	0.57	n.d.
126	2F	1.67	<DL	<DL	2.41	313	0.739	n.d.
126	3A	1.55	<DL	0.418	0.0799	57.5	0.552	n.d.
126	3B	1.51	<DL	<DL	0.347	172	0.702	n.d.
126	3C	<DL	<DL	<DL	0.182	419	0.464	n.d.
126	3D	1.08	<DL	<DL	0.401	347	0.518	n.d.
126	3E	1.4	<DL	<DL	1.44	124	0.572	n.d.
126	3F	1.85	<DL	<DL	3.22	343	0.828	n.d.
126	4A	<DL	<DL	<DL	<DL	417	0.497	n.d.
126	4B	1.53	<DL	<DL	0.48	261	0.659	n.d.
126	4C	1.02	<DL	<DL	0.307	584	0.649	n.d.

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
126	4D	1.03	<DL	<DL	0.41	951	0.482	n.d.
126	4E	1.44	<DL	<DL	1.73	111	0.584	n.d.
126	4F	1.63	<DL	<DL	2.03	486	0.735	n.d.
126	5A	2.43	<DL	0.833	0.112	1410	0.778	n.d.
126	5B	2.08	<DL	<DL	0.492	209	0.833	n.d.
126	5C	1.15	<DL	<DL	0.209	347	0.472	n.d.
126	5D	1.07	<DL	<DL	0.263	719	0.459	n.d.
126	5E	1.42	<DL	<DL	1.78	89.1	0.559	n.d.
126	5F	1.52	<DL	<DL	1.96	258	0.724	n.d.
126	6A	2.74	<DL	0.456	0.941	948	0.725	n.d.
126	6B	1.98	<DL	<DL	0.403	233	0.792	n.d.
126	6C	1.23	<DL	<DL	0.221	444	0.479	n.d.
126	6D	1.32	<DL	<DL	0.203	363	0.459	n.d.
126	6E	1.61	<DL	<DL	1.7	89.5	0.61	n.d.
126	6F	1.73	<DL	<DL	1.82	228	0.695	n.d.
126	BCAL	<DL	<DL	<DL	<DL	136	0.372	n.d.
126	BDOL	<DL	<DL	<DL	<DL	41.1	0.366	n.d.
126	R2	<DL	<DL	<DL	<DL	70.1	0.363	n.d.
130	1A	2.15	<DL	0.575	0.094	1280	0.788	<DL
130	1B	2.5	<DL	<DL	0.431	307	0.871	<DL
130	1C	1.14	<DL	<DL	0.281	451	0.51	<DL
130	1D	<DL	<DL	<DL	0.366	742	0.477	<DL
130	1E	1.54	<DL	<DL	2.56	151	0.551	0.0665
130	1F	<DL	<DL	<DL	1.51	256	0.589	0.238
130	2A	1.99	<DL	0.557	0.119	111	0.572	<DL
130	2B	2.97	<DL	0.516	0.403	354	0.81	<DL
130	2C	1.14	<DL	<DL	0.299	412	0.494	<DL
130	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
130	2E	1.56	<DL	<DL	2.57	115	0.56	0.038
130	2F	1.63	<DL	<DL	2.97	343	0.757	0.152
130	3A	1.56	<DL	0.488	0.0937	71	1.03	<DL
130	3B	1.41	<DL	<DL	0.348	192	0.689	<DL
130	3C	<DL	<DL	<DL	0.219	448	0.483	<DL
130	3D	<DL	<DL	<DL	0.36	365	0.913	<DL
130	3E	1.33	<DL	<DL	1.63	135	0.574	0.0665
130	3F	<DL	<DL	<DL	1.69	217	0.626	0.38
130	4A	<DL	<DL	<DL	<DL	629	0.466	<DL
130	4B	1.19	<DL	<DL	0.48	284	0.681	<DL
130	4C	<DL	<DL	<DL	0.272	549	0.456	<DL
130	4D	<DL	<DL	<DL	0.324	962	0.488	<DL
130	4E	1.78	<DL	<DL	1.58	111	0.554	<DL
130	4F	<DL	<DL	<DL	0.598	138	0.486	0.095

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
130	5A	1.86	<DL	0.97	0.0862	1840	0.729	0.038
130	5B	2.44	<DL	<DL	0.478	213	0.851	n.d.
130	5C	1.35	<DL	<DL	0.226	349	0.466	<DL
130	5D	1.16	<DL	<DL	0.251	644	0.458	0.0665
130	5E	1.55	<DL	<DL	1.68	90.1	0.55	<DL
130	5F	<DL	<DL	<DL	1.39	263	0.609	0.152
130	6A	2.23	<DL	<DL	0.219	622	0.657	0.095
130	6B	1.81	<DL	<DL	0.444	243	0.794	<DL
130	6C	1.07	<DL	<DL	0.23	425	0.465	<DL
130	6D	<DL	<DL	<DL	0.195	515	0.459	<DL
130	6E	1.58	<DL	<DL	1.93	93.7	0.663	0.038
130	6F	<DL	<DL	<DL	1.24	182	0.59	0.124
130	BCAL	<DL	<DL	<DL	<DL	47	0.365	n.d.
130	BDOL	<DL	<DL	<DL	<DL	61.6	0.361	n.d.
130	R3	<DL	<DL	<DL	<DL	43.9	0.364	n.d.
133	1A	1.83	<DL	0.543	0.0781	909	<DL	n.d.
133	1B	2.54	<DL	<DL	0.394	257	0.198	n.d.
133	1C	1.08	<DL	<DL	0.272	448	<DL	n.d.
133	1D	1.25	<DL	<DL	0.536	959	<DL	n.d.
133	1E	1.44	<DL	<DL	2.33	137	<DL	n.d.
133	1F	1.78	<DL	<DL	2.67	316	<DL	n.d.
133	2A	1.79	<DL	0.53	0.0863	82.6	<DL	n.d.
133	2B	2.68	<DL	0.509	0.331	243	<DL	n.d.
133	2C	1.03	<DL	<DL	0.34	443	<DL	n.d.
133	2D	1.35	<DL	<DL	0.594	725	<DL	n.d.
133	2E	1.46	<DL	<DL	2.39	113	<DL	n.d.
133	2F	1.46	<DL	<DL	2.65	298	<DL	n.d.
133	3A	1.68	<DL	0.468	0.0717	44.8	<DL	n.d.
133	3B	1.55	<DL	<DL	0.327	175	<DL	n.d.
133	3C	1	<DL	<DL	0.177	418	<DL	n.d.
133	3D	1.12	<DL	<DL	0.322	365	<DL	n.d.
133	3E	1.52	<DL	<DL	1.63	133	<DL	n.d.
133	3F	1.73	<DL	<DL	3.02	302	0.122	n.d.
133	4A	<DL	<DL	<DL	<DL	871	<DL	n.d.
133	4B	1.21	<DL	<DL	0.443	235	<DL	n.d.
133	4C	1	<DL	<DL	0.283	507	<DL	n.d.
133	4D	1.11	<DL	<DL	0.389	879	<DL	n.d.
133	4E	1.4	<DL	<DL	1.79	112	<DL	n.d.
133	4F	1.46	<DL	<DL	1.97	317	<DL	n.d.
133	5A	2.3	<DL	1.13	0.0736	1370	<DL	n.d.
133	5B	2.25	<DL	<DL	0.478	181	0.211	n.d.
133	5C	1.18	<DL	<DL	0.204	319	<DL	n.d.

Table 13: cont

		Element, Unit, Detection Limit						
Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
133	5D	1.16	<DL	<DL	0.264	586	<DL	n.d.
133	5E	1.38	<DL	<DL	1.58	80.5	<DL	n.d.
133	5F	1.31	<DL	<DL	1.75	246	<DL	n.d.
133	6A	3.61	<DL	0.499	0.259	596	<DL	n.d.
133	6B	1.54	<DL	<DL	0.395	207	0.125	n.d.
133	6C	<DL	<DL	<DL	0.196	375	<DL	n.d.
133	6D	<DL	<DL	<DL	0.181	319	<DL	n.d.
133	6E	1.36	<DL	<DL	1.59	80.8	<DL	n.d.
133	6F	1.37	<DL	<DL	1.55	217	<DL	n.d.
133	BCAL	<DL	<DL	<DL	<DL	97.4	<DL	n.d.
133	BDOL	<DL	<DL	<DL	<DL	75.2	<DL	n.d.
133	R4	<DL	<DL	<DL	<DL	39.1	<DL	n.d.
138	1A	2.5	<DL	0.648	0.0838	1750	<DL	<DL
138	1B	2.42	<DL	<DL	0.385	292	0.172	0.0475
138	1C	<DL	<DL	<DL	0.265	452	<DL	<DL
138	1D	1.33	<DL	<DL	0.557	1680	<DL	<DL
138	1E	1.76	<DL	<DL	2.42	146	<DL	0.076
138	1F	1.84	<DL	<DL	2.72	325	<DL	0.304
138	2A	1.69	<DL	0.555	0.0773	103	<DL	<DL
138	2B	2.73	<DL	0.433	0.241	196	<DL	<DL
138	2C	1.18	<DL	<DL	0.27	439	<DL	<DL
138	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
138	2E	1.5	<DL	<DL	2.12	121	<DL	0.0475
138	2F	1.6	<DL	<DL	2.67	338	<DL	0.162
138	3A	1.51	<DL	0.418	<DL	49	<DL	<DL
138	3B	1.39	<DL	<DL	0.363	208	<DL	<DL
138	3C	<DL	<DL	<DL	0.186	434	<DL	<DL
138	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
138	3E	1.3	<DL	<DL	2.12	145	<DL	0.076
138	3F	1.66	<DL	<DL	3.42	381	0.165	0.418
138	4A	<DL	<DL	<DL	<DL	1440	<DL	0.076
138	4B	1.06	<DL	<DL	0.434	254	<DL	<DL
138	4C	<DL	<DL	<DL	0.249	526	<DL	<DL
138	4D	<DL	<DL	<DL	0.296	1280	<DL	<DL
138	4E	1.35	<DL	<DL	1.59	118	<DL	<DL
138	4F	1.31	<DL	<DL	1.87	484	<DL	0.162
138	5A	1.02	<DL	0.511	<DL	772	<DL	<DL
138	5B	2.24	<DL	<DL	0.479	208	0.196	<DL
138	5C	1.11	<DL	<DL	0.197	318	<DL	<DL
138	5D	1.22	<DL	<DL	0.282	996	<DL	<DL
138	5E	1.25	<DL	<DL	1.55	78.9	<DL	<DL
138	5F	1.22	<DL	<DL	1.74	318	<DL	0.105

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
138	6A	2.81	<DL	0.441	0.24	1980	<DL	<DL
138	6B	1.61	<DL	<DL	0.419	253	0.105	<DL
138	6C	<DL	<DL	<DL	0.196	384	<DL	<DL
138	6D	<DL	<DL	<DL	0.189	583	<DL	<DL
138	6E	1.27	<DL	<DL	1.71	83.1	<DL	0.0475
138	6F	1.31	<DL	<DL	1.59	239	<DL	0.105
138	BCAL	<DL	<DL	<DL	<DL	105	<DL	n.d.
138	BDOL	<DL	<DL	<DL	<DL	109	<DL	n.d.
138	R5	<DL	<DL	<DL	<DL	60.8	<DL	n.d.
140	1A	2.28	2.65	0.666	0.119	1140	0.373	n.d.
140	1B	2.54	1.71	<DL	0.375	245	0.538	n.d.
140	1C	1.18	1.77	<DL	0.297	453	0.171	n.d.
140	1D	1.3	1.75	<DL	0.581	944	0.199	n.d.
140	1E	1.66	1.72	<DL	2.51	134	0.192	n.d.
140	1F	1.81	1.71	<DL	2.95	253	0.416	n.d.
140	2A	1.84	1.63	0.455	0.0876	71	0.198	n.d.
140	2B	2.74	1.59	0.452	0.257	163	0.432	n.d.
140	2C	1.16	1.59	<DL	0.334	404	0.14	n.d.
140	2D	1.65	1.58	<DL	0.828	790	0.367	n.d.
140	2E	1.94	<DL	<DL	2.01	123	0.17	n.d.
140	2F	1.99	<DL	<DL	2.35	311	0.36	n.d.
140	3A	1.83	<DL	0.501	0.0998	48.1	0.216	n.d.
140	3B	1.59	<DL	<DL	0.344	155	0.299	n.d.
140	3C	<DL	<DL	<DL	0.178	422	<DL	n.d.
140	3D	1.17	<DL	<DL	0.362	397	0.125	n.d.
140	3E	1.63	<DL	<DL	2.12	140	0.194	n.d.
140	3F	1.98	<DL	<DL	3.36	327	0.458	n.d.
140	4A	<DL	<DL	<DL	<DL	527	0.117	n.d.
140	4B	1.19	<DL	<DL	0.39	220	0.294	n.d.
140	4C	1	<DL	<DL	0.256	523	<DL	n.d.
140	4D	1.17	<DL	<DL	0.311	1040	0.107	n.d.
140	4E	1.4	<DL	<DL	1.43	109	0.142	n.d.
140	4F	1.51	<DL	<DL	1.83	265	0.275	n.d.
140	5A	1.31	<DL	0.517	0.0622	567	<DL	n.d.
140	5B	2.24	<DL	<DL	0.482	154	0.522	n.d.
140	5C	1.2	<DL	<DL	0.197	311	<DL	n.d.
140	5D	1.21	<DL	<DL	0.227	778	<DL	n.d.
140	5E	1.33	<DL	<DL	1.41	79.2	0.154	n.d.
140	5F	1.49	<DL	<DL	1.7	210	0.316	n.d.
140	6A	2.44	<DL	0.462	0.176	359	0.275	n.d.
140	6B	1.95	<DL	<DL	0.401	241	0.424	n.d.
140	6C	1.24	<DL	<DL	0.189	403	<DL	n.d.

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
140	6D	1.29	<DL	<DL	0.161	363	<DL	n.d.
140	6E	1.7	<DL	<DL	1.39	82.3	0.212	n.d.
140	6F	1.7	<DL	<DL	1.39	184	0.352	n.d.
140	BCAL	<DL	<DL	<DL	<DL	109	<DL	n.d.
140	BDOL	<DL	<DL	<DL	<DL	69.8	<DL	n.d.
140	R6	<DL	<DL	<DL	<DL	21.3	<DL	n.d.
144	1A	1.9	<DL	0.794	0.108	2090	0.28	<DL
144	1B	2.52	<DL	<DL	0.358	275	0.469	<DL
144	1C	1.18	<DL	<DL	0.278	534	0.144	<DL
144	1D	1.21	<DL	<DL	0.478	907	0.139	<DL
144	1E	1.61	<DL	<DL	2.04	153	0.162	0.076
144	1F	1.72	<DL	<DL	2.43	297	0.368	0.304
144	2A	1.56	<DL	0.563	0.102	87.7	0.154	<DL
144	2B	2.74	<DL	0.567	0.236	189	0.395	<DL
144	2C	1.14	<DL	<DL	0.244	405	0.105	<DL
144	2D	1.2	<DL	<DL	0.432	688	0.245	n.d.
144	2E	1.66	<DL	<DL	2.36	133	0.17	0.0475
144	2F	1.45	<DL	<DL	2.52	277	0.341	0.133
144	3A	1.5	<DL	0.498	0.0922	51.1	0.193	<DL
144	3B	1.38	<DL	<DL	0.325	185	0.313	<DL
144	3C	<DL	<DL	<DL	0.161	429	<DL	<DL
144	3D	<DL	<DL	<DL	0.325	303	<DL	<DL
144	3E	1.41	<DL	<DL	2.12	151	0.197	0.076
144	3F	1.81	<DL	<DL	3.24	375	0.462	0.39
144	4A	<DL	<DL	0.419	0.0634	1610	0.147	0.0475
144	4B	1.08	<DL	<DL	0.383	221	0.299	<DL
144	4C	<DL	<DL	<DL	0.233	494	<DL	<DL
144	4D	1.42	<DL	<DL	0.249	1080	0.102	<DL
144	4E	1.77	<DL	<DL	1.16	118	0.148	<DL
144	4F	1.73	<DL	<DL	1.78	379	0.276	0.133
144	5A	1.02	<DL	0.521	<DL	574	<DL	0.0475
144	5B	2.46	<DL	<DL	0.421	162	0.529	<DL
144	5C	1.28	<DL	<DL	0.15	308	<DL	<DL
144	5D	1.39	<DL	<DL	0.253	727	<DL	<DL
144	5E	1.54	<DL	<DL	1.35	80.5	0.163	<DL
144	5F	1.54	<DL	<DL	1.66	280	0.301	0.105
144	6A	2.23	<DL	<DL	0.155	522	0.241	0.0475
144	6B	1.64	<DL	<DL	0.38	218	0.393	<DL
144	6C	1.11	<DL	<DL	0.159	396	0.123	<DL
144	6D	1.09	<DL	<DL	0.149	496	<DL	<DL
144	6E	1.49	<DL	<DL	1.49	76.9	0.217	<DL
144	6F	1.46	<DL	<DL	1.32	195	0.288	0.076

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
144	BCAL	<DL	<DL	<DL	<DL	130	<DL	n.d.
144	BDOL	<DL	<DL	<DL	<DL	85.6	<DL	n.d.
144	R1	<DL	<DL	<DL	<DL	38.1	<DL	n.d.
147	1A	2.06	<DL	0.491	0.0832	597	0.31	n.d.
147	1B	2.48	<DL	<DL	0.386	328	0.52	n.d.
147	1C	1.1	<DL	<DL	0.251	491	0.167	n.d.
147	1D	1.53	<DL	<DL	0.606	1180	0.219	n.d.
147	1E	1.59	<DL	<DL	1.96	150	0.187	n.d.
147	1F	1.74	<DL	<DL	2.73	324	0.398	n.d.
147	2A	1.73	<DL	0.51	0.0844	74.6	0.191	n.d.
147	2B	2.74	<DL	0.419	0.222	163	0.431	n.d.
147	2C	1.1	<DL	<DL	0.25	388	0.151	n.d.
147	2D	1.46	<DL	<DL	0.626	845	0.383	n.d.
147	2E	1.62	<DL	<DL	2.3	139	0.201	n.d.
147	2F	1.66	<DL	<DL	2.74	340	0.418	n.d.
147	3A	1.94	<DL	0.422	0.0764	54.6	0.274	n.d.
147	3B	1.59	<DL	<DL	0.288	166	0.345	n.d.
147	3C	1.12	<DL	<DL	0.137	372	0.104	n.d.
147	3D	1.11	<DL	<DL	0.302	362	0.14	n.d.
147	3E	1.63	<DL	<DL	2.18	144	0.231	n.d.
147	3F	2.28	<DL	<DL	3.72	392	0.552	n.d.
147	4A	1.19	<DL	<DL	<DL	1290	0.237	n.d.
147	4B	1.3	<DL	<DL	0.37	205	0.341	n.d.
147	4C	<DL	<DL	<DL	0.217	492	<DL	n.d.
147	4D	1.24	<DL	<DL	0.233	839	0.132	n.d.
147	4E	1.53	<DL	<DL	1.35	118	0.189	n.d.
147	4F	1.45	<DL	<DL	1.68	339	0.313	n.d.
147	5A	1.28	<DL	0.51	<DL	717	0.129	n.d.
147	5B	2.27	<DL	<DL	0.421	138	0.581	n.d.
147	5C	1.15	<DL	<DL	0.145	296	0.138	n.d.
147	5D	1.27	<DL	<DL	0.181	610	0.113	n.d.
147	5E	1.36	<DL	<DL	1.34	72	0.304	n.d.
147	5F	1.52	<DL	<DL	1.73	231	0.336	n.d.
147	6A	2.96	<DL	<DL	0.2	590	0.344	n.d.
147	6B	1.5	<DL	<DL	0.356	198	0.439	n.d.
147	6C	1.07	<DL	<DL	0.195	401	0.121	n.d.
147	6D	1	<DL	<DL	0.154	421	0.113	n.d.
147	6E	1.42	<DL	<DL	1.31	75.7	0.239	n.d.
147	6F	1.48	<DL	<DL	1.3	172	0.325	n.d.
147	BCAL	<DL	<DL	<DL	<DL	96.6	0.25	n.d.
147	BDOL	<DL	<DL	<DL	<DL	69.2	<DL	n.d.
147	R2	<DL	<DL	<DL	<DL	28.3	<DL	n.d.

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
151	1A	1.78	<DL	0.755	0.0799	627	0.294	<DL
151	1B	2.43	<DL	<DL	0.367	357	0.519	<DL
151	1C	<DL	<DL	<DL	0.224	488	0.157	<DL
151	1D	1.51	<DL	<DL	0.402	832	0.209	<DL
151	1E	2.11	<DL	<DL	2.44	187	0.216	0.076
151	1F	1.92	<DL	<DL	2.8	332	0.406	0.276
151	2A	1.65	<DL	0.512	0.0726	68	0.203	<DL
151	2B	2.66	<DL	0.434	0.191	156	0.437	0.0475
151	2C	1.11	<DL	<DL	0.185	378	0.126	<DL
151	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
151	2E	1.59	<DL	<DL	1.99	150	0.188	0.0475
151	2F	1.51	<DL	<DL	2.41	319	0.388	0.133
151	3A	2.09	<DL	0.474	0.0978	68.8	0.293	0.0475
151	3B	1.55	<DL	<DL	0.319	196	0.372	<DL
151	3C	<DL	<DL	<DL	0.118	367	0.102	<DL
151	3D	<DL	<DL	<DL	0.34	365	0.128	<DL
151	3E	1.43	<DL	<DL	3	149	0.23	0.105
151	3F	1.65	<DL	<DL	3.58	330	0.474	0.361
151	4A	<DL	<DL	<DL	<DL	471	0.135	<DL
151	4B	1.17	<DL	<DL	0.383	214	0.332	<DL
151	4C	<DL	<DL	<DL	0.219	568	0.116	<DL
151	4D	1.07	<DL	<DL	0.269	878	0.144	<DL
151	4E	1.3	<DL	<DL	1.44	115	0.207	<DL
151	4F	1.36	<DL	<DL	1.86	459	0.299	0.133
151	5A	1.39	<DL	0.563	<DL	11.8	0.145	<DL
151	5B	2.24	<DL	<DL	0.437	139	0.568	<DL
151	5C	1.04	<DL	<DL	0.157	277	0.109	<DL
151	5D	1.18	<DL	<DL	0.239	641	0.121	<DL
151	5E	1.26	<DL	<DL	1.27	72.7	0.193	<DL
151	5F	1.36	<DL	<DL	1.79	274	0.591	0.105
151	6A	3.28	<DL	0.425	0.186	47.8	0.336	<DL
151	6B	1.44	<DL	<DL	0.37	190	0.427	<DL
151	6C	<DL	<DL	<DL	0.182	368	0.114	<DL
151	6D	<DL	<DL	<DL	0.154	436	0.122	<DL
151	6E	1.4	<DL	<DL	1.43	75.5	0.239	<DL
151	6F	1.25	<DL	<DL	1.46	186	0.328	0.076
151	BCAL	<DL	<DL	<DL	<DL	113	<DL	n.d.
151	BDOL	<DL	<DL	<DL	<DL	112	<DL	n.d.
151	R3	<DL	<DL	<DL	<DL	35.6	<DL	n.d.
154	1A	1.38	<DL	0.433	0.0694	354	0.182	0.0665
154	1B	2.66	<DL	<DL	0.358	308	0.505	<DL
154	1C	1.28	<DL	<DL	0.351	545	0.174	<DL

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
154	1D	<DL	<DL	<DL	0.518	898	0.177	<DL
154	1E	1.58	<DL	<DL	2.01	155	0.189	0.038
154	1F	1.39	<DL	<DL	2.28	227	0.35	0.152
154	2A	1.88	<DL	0.487	0.105	85.8	0.218	<DL
154	2B	2.79	<DL	<DL	0.203	166	0.421	<DL
154	2C	1.08	<DL	<DL	0.205	351	0.13	<DL
154	2D	<DL	<DL	<DL	0.337	445	0.198	<DL
154	2E	1.59	<DL	<DL	2.29	154	0.21	<DL
154	2F	<DL	<DL	<DL	1.88	249	0.279	0.095
154	3A	1.49	<DL	0.587	0.102	64.1	0.258	<DL
154	3B	1.48	<DL	<DL	0.284	172	0.317	<DL
154	3C	<DL	<DL	<DL	0.127	367	<DL	<DL
154	3D	<DL	<DL	<DL	0.284	350	0.14	<DL
154	3E	1.42	<DL	<DL	2.67	146	0.228	0.038
154	3F	1.12	<DL	<DL	2.17	243	0.353	0.323
154	4A	<DL	<DL	<DL	<DL	113	0.171	<DL
154	4B	1.1	<DL	<DL	0.361	204	0.35	<DL
154	4C	<DL	<DL	<DL	0.204	479	0.108	<DL
154	4D	<DL	<DL	<DL	0.233	721	0.12	<DL
154	4E	1.34	<DL	<DL	1.26	123	0.193	<DL
154	4F	<DL	<DL	<DL	0.894	214	0.191	0.124
154	5A	1.35	<DL	0.785	<DL	16.7	<DL	n.d.
154	5B	2.56	<DL	<DL	0.438	123	0.236	<DL
154	5C	1.47	<DL	<DL	0.172	269	<DL	<DL
154	5D	1.04	<DL	<DL	0.235	568	<DL	<DL
154	5E	1.5	<DL	<DL	1.45	73	<DL	<DL
154	5F	1.48	<DL	<DL	1.8	230	<DL	0.0665
154	6A	1.9	<DL	0.451	0.154	46.9	<DL	<DL
154	6B	1.8	<DL	<DL	0.431	186	0.128	<DL
154	6C	1.14	<DL	<DL	0.203	364	<DL	<DL
154	6D	<DL	<DL	<DL	0.174	442	<DL	<DL
154	6E	1.34	<DL	<DL	1.55	72.7	<DL	<DL
154	6F	<DL	<DL	<DL	1.28	172	<DL	0.038
154	BCAL	<DL	<DL	<DL	<DL	50.1	<DL	n.d.
154	BDOL	<DL	<DL	<DL	<DL	74.4	<DL	n.d.
154	R4	<DL	<DL	<DL	<DL	8.75	<DL	n.d.
172	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	1B	16.86	n.d.	2.109	0.654	600	2.232	n.d.
172	1C	1.18	<DL	<DL	0.352	552	0.228	<DL
172	1D	1.36	<DL	<DL	0.655	1900	0.268	0.057
172	1E	1.33	<DL	<DL	1.96	182	0.245	n.d.
172	1F	<DL	<DL	<DL	2.54	491	0.422	0.152

Table 13: cont

Time (days)	Column # and port location	Ti µg/L 1	Tl µg/L 0.6	V µg/L 0.4	Y µg/L 0.06	Zn µg/L 1	Zr µg/L 0.1	F- mg/L 0.029
		Element, Unit, Detection Limit						
172	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2E	1.19	<DL	<DL	1.81	172	0.255	<DL
172	2F	<DL	<DL	<DL	2.82	208	0.4	0.105
172	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	3B	2.42	<DL	0.759	0.356	275	0.452	<DL
172	3C	<DL	<DL	<DL	0.174	501	0.172	<DL
172	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	3E	n.d.	n.d.	n.d.	3.42	204	0.378	0.105
172	3F	<DL	<DL	<DL	3.08	296	0.465	0.266
172	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	4B	1.19	<DL	<DL	0.558	307	0.407	<DL
172	4C	<DL	<DL	<DL	0.219	459	0.167	<DL
172	4D	n.d.	n.d.	n.d.	0.267	1500	0.2445	0.038
172	4E	1.17	<DL	<DL	1.13	162	0.241	<DL
172	4F	<DL	<DL	<DL	1.61	615	0.346	0.0665
172	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	5B	9.5725	n.d.	1.785	n.d.	124.6	0.82775	n.d.
172	5C	<DL	<DL	<DL	0.164	318	0.166	<DL
172	5D	1.01	<DL	<DL	0.261	1710	0.251	<DL
172	5E	1.86	<DL	<DL	1.23	87.9	0.247	<DL
172	5F	<DL	<DL	<DL	1.45	520	0.349	0.038
172	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	BCAL	<DL	<DL	<DL	<DL	95.2	<DL	n.d.
172	BDOL	<DL	<DL	<DL	<DL	256	<DL	n.d.

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
0	1A	15.7	<DL	<DL	3.44	0.656	9.03	4.13
0	1B	17.7	<DL	<DL	3.18	<DL	20	4.76
0	1C	19.3	<DL	<DL	0.0475	<DL	23.6	4.8
0	1D	5.92	<DL	<DL	1.02	<DL	26.3	4.64
0	1E	14.6	<DL	0.114	3.9	<DL	19.9	4.67
0	1F	7.63	<DL	0.114	7.66	<DL	20.4	4.28
0	2A	2.27	<DL	<DL	1.42	<DL	4.73	4.33
0	2B	6.57	<DL	<DL	0.39	<DL	<DL	4.49
0	2C	6.6	<DL	<DL	<DL	<DL	<DL	4.73
0	2D	14.5	<DL	<DL	2.07	<DL	<DL	4.55
0	2E	4.75	<DL	<DL	0.076	<DL	<DL	4.75
0	2F	4.38	<DL	<DL	1.24	<DL	<DL	4.42
0	3A	4.32	<DL	<DL	2.38	<DL	14.3	4.28
0	3B	23.6	<DL	<DL	0.333	<DL	25.1	4.72
0	3C	8.17	<DL	<DL	0.0475	<DL	24.2	4.79
0	3D	31.3	<DL	<DL	3.72	<DL	34.9	4.52
0	3E	13.8	<DL	<DL	0.333	<DL	31.3	4.87
0	3F	8.94	<DL	<DL	4.49	<DL	25.6	4.67
0	4A	2.95	<DL	<DL	0.817	<DL	5.5	4.48
0	4B	13.7	<DL	<DL	0.304	<DL	23.8	4.76
0	4C	7.46	<DL	<DL	0.247	<DL	25.1	4.77
0	4D	5.86	<DL	<DL	0.618	<DL	26.3	4.73
0	4E	10.6	<DL	<DL	0.219	<DL	27.2	4.8
0	4F	12.2	<DL	<DL	6.49	<DL	25	4.24
0	5A	4.81	<DL	<DL	0.361	0.57	1.57	4.54
0	5B	22.8	<DL	<DL	0.874	<DL	16.8	4.7
0	5C	11.9	<DL	<DL	<DL	<DL	20.7	4.76
0	5D	5.98	<DL	<DL	0.675	<DL	23.3	4.67
0	5E	20.4	<DL	<DL	0.561	<DL	22.3	4.78
0	5F	12.9	<DL	<DL	6.6	<DL	21.3	4.28
0	6A	3.58	<DL	<DL	1.07	<DL	10.5	4.67
0	6B	11.1	<DL	<DL	0.561	<DL	19.3	4.78
0	6C	13.9	<DL	<DL	0.0475	<DL	21.8	4.78
0	6D	11.2	<DL	<DL	8.17	<DL	34.8	4.53
0	6E	13.4	<DL	<DL	1.02	<DL	23.3	4.77
0	6F	12.6	<DL	<DL	7.77	<DL	24.9	4.23
0	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.37
0	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.43
0	R1	2.44	<DL	<DL	<DL	<DL	0.314	4.76
4	1A	12.802	<DL	<DL	3.774	<DL	10.656	4.1

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
4	1B	7.37	<DL	<DL	2.19	<DL	19.6	4.61
4	1C	6.18	<DL	<DL	0.0475	<DL	25	4.73
4	1D	5.92	<DL	<DL	0.447	<DL	25	4.62
4	1E	5.89	<DL	<DL	1.39	<DL	22	4.68
4	1F	6.66	<DL	<DL	4.92	<DL	18.2	4.4
4	2A	5.41	<DL	<DL	1.33	<DL	24.2	4.88
4	2B	10.9	<DL	<DL	1.05	<DL	55.9	4.28
4	2C	5.95	<DL	<DL	0.0475	<DL	27.4	4.66
4	2D	4.21	<DL	<DL	0.19	<DL	27	4.74
4	2E	4.35	<DL	<DL	0.0475	<DL	24.5	4.69
4	2F	6.52	<DL	<DL	1.36	<DL	25.7	4.39
4	3A	2.38	<DL	<DL	1.53	<DL	8.55	5.87
4	3B	4.95	<DL	<DL	0.589	<DL	27.2	4.55
4	3C	4.52	<DL	<DL	0.0475	<DL	27.4	4.67
4	3D	5.86	<DL	<DL	0.361	<DL	27.3	5.02
4	3E	5.41	<DL	<DL	3.04	<DL	25.7	4.77
4	3F	6.32	<DL	<DL	1.64	<DL	23.1	4.76
4	4A	2.1	<DL	<DL	2.56	<DL	4.67	4.36
4	4B	4.12	<DL	<DL	0.418	<DL	21.1	4.6
4	4C	4.32	<DL	<DL	0.0475	<DL	22.3	4.63
4	4D	4.41	<DL	<DL	0.133	<DL	23.3	4.76
4	4E	6.18	<DL	<DL	0.0475	<DL	26.5	4.68
4	4F	9.62	<DL	<DL	2.98	<DL	23.3	4.34
4	5A	8.6	0.057	<DL	1.81	<DL	32	6.87
4	5B	6.46	<DL	<DL	1.5	<DL	26.8	4.64
4	5C	4.92	<DL	<DL	<DL	<DL	24.1	4.69
4	5D	4.38	<DL	<DL	0.105	<DL	21.8	6.2
4	5E	4.55	<DL	<DL	0.162	<DL	24	4.67
4	5F	9.2	<DL	<DL	2.64	<DL	23.2	4.48
4	6A	2.58	<DL	<DL	0.846	<DL	11.4	6.7
4	6B	4.49	<DL	<DL	1.1	<DL	22.6	4.63
4	6C	4.24	<DL	<DL	0.133	<DL	21.6	4.67
4	6D	4.55	<DL	<DL	1.24	<DL	25.7	4.95
4	6E	7.17	<DL	<DL	0.19	<DL	24.9	4.73
4	6F	8.43	<DL	<DL	3.18	<DL	24.9	4.36
4	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.03
4	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.14
4	R3	1.3	<DL	<DL	<DL	<DL	0.456	5.36
7	1A	2.33	<DL	<DL	1.81	<DL	5.73	4.82
7	1B	5.78	<DL	<DL	2.33	<DL	22.5	4.99
7	1C	5.75	<DL	<DL	0.0475	<DL	27.7	5.32

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
7	1D	5.35	<DL	<DL	0.589	<DL	26.9	5.14
7	1E	5.63	<DL	<DL	0.447	<DL	24.2	5.31
7	1F	6.8	<DL	<DL	3.67	<DL	20.3	4.98
7	2A	3.07	<DL	<DL	1.64	<DL	18	5.15
7	2B	8.63	<DL	<DL	1.33	<DL	59.3	4.66
7	2C	7	<DL	<DL	0.076	<DL	31.2	5.19
7	2D	4.78	<DL	<DL	0.162	<DL	34.4	5
7	2E	4.44	<DL	<DL	0.0475	<DL	25.2	5.41
7	2F	6.94	<DL	<DL	1.42	<DL	32.7	4.74
7	3A	2.47	<DL	<DL	2.98	<DL	15.8	6.28
7	3B	5.43	<DL	<DL	1.02	<DL	40.8	4.99
7	3C	4.81	<DL	<DL	0.0475	<DL	26.2	5.34
7	3D	6	<DL	<DL	1.19	<DL	32.1	5.06
7	3E	5.38	<DL	<DL	<DL	<DL	41.2	4.64
7	3F	5.98	<DL	<DL	1.42	<DL	27	5.28
7	4A	1.92	<DL	<DL	2.05	<DL	3.05	4.94
7	4B	4.11	<DL	<DL	0.77	<DL	22.1	5.2
7	4C	4.57	<DL	<DL	<DL	<DL	25.2	5.34
7	4D	4.43	<DL	<DL	0.228	<DL	25.9	5.23
7	4E	6.11	<DL	<DL	<DL	<DL	28.2	5.34
7	4F	8.53	<DL	<DL	1.65	<DL	27.2	4.85
7	5A	3.97	<DL	<DL	1.88	<DL	16.9	7.81
7	5B	4.91	<DL	<DL	1.43	<DL	30.1	5.75
7	5C	5.6	<DL	<DL	<DL	<DL	27.7	5.24
7	5D	5.23	<DL	<DL	0.171	<DL	27.1	4.89
7	5E	4.6	<DL	<DL	0.057	<DL	26.2	5.12
7	5F	7.85	<DL	<DL	1.03	<DL	27.4	4.84
7	6A	2.15	<DL	<DL	0.912	<DL	9.01	7.09
7	6B	4.57	<DL	<DL	1.51	<DL	27.9	5.17
7	6C	4.6	<DL	<DL	0.143	<DL	24.5	5.28
7	6D	4.74	<DL	<DL	0.884	<DL	33.4	4.44
7	6E	6.71	<DL	<DL	0.057	<DL	27.9	5.15
7	6F	7.73	<DL	<DL	1.88	<DL	29.3	4.57
7	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.73
7	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.55
7	R4	1.27	<DL	<DL	<DL	<DL	0.485	5.3
11	1A	2.2	<DL	<DL	2.65	0.646	4.76	4.47
11	1B	5.42	<DL	<DL	3.25	<DL	25.6	4.75
11	1C	5.88	<DL	<DL	0.342	<DL	31.6	4.95
11	1D	4.94	<DL	<DL	0.656	<DL	29.8	4.93
11	1E	5.6	<DL	<DL	0.0855	<DL	27.2	5.13
11	1F	6.82	<DL	<DL	2.59	<DL	22.7	4.85

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
11	2A	2.49	<DL	<DL	2.34	<DL	13	4.98
11	2B	5.62	<DL	<DL	1.54	<DL	45.6	4.58
11	2C	6.91	<DL	<DL	<DL	<DL	40.6	4.78
11	2D	6.45	<DL	<DL	1.45	<DL	43.5	4.68
11	2E	4.68	<DL	<DL	0.143	<DL	27.8	5.14
11	2F	5.91	<DL	<DL	0.627	<DL	26.5	4.79
11	3A	2.83	0.057	<DL	5.47	<DL	17.7	5.7
11	3B	4.54	<DL	<DL	1.34	<DL	42	4.82
11	3C	5.11	<DL	<DL	0.0855	<DL	33.6	4.87
11	3D	6.79	<DL	<DL	1.11	<DL	37.4	4.91
11	3E	5.31	<DL	<DL	<DL	<DL	27.5	5.15
11	3F	5.91	<DL	<DL	1.17	<DL	25.7	4.81
11	4A	2.43	<DL	<DL	2.96	<DL	3.9	4.78
11	4B	3.71	<DL	<DL	1.68	<DL	22.8	5.02
11	4C	4.43	<DL	<DL	0.2	<DL	26.6	5.13
11	4D	4.31	<DL	<DL	0.371	<DL	29.1	4.72
11	4E	5.77	<DL	<DL	0.057	<DL	29.2	5.18
11	4F	7.16	<DL	<DL	0.827	<DL	26.9	4.47
11	5A	6.14	0.143	<DL	6.61	<DL	27.3	n.d.
11	5B	3.8	<DL	<DL	1.68	<DL	29.6	5.62
11	5C	5.25	<DL	<DL	0.057	<DL	28.7	5.21
11	5D	5.62	<DL	<DL	0.171	<DL	27	4.71
11	5E	4.91	<DL	<DL	<DL	<DL	26	5.2
11	5F	7.48	<DL	<DL	0.741	<DL	27.2	4.53
11	6A	2.18	<DL	<DL	1.25	<DL	6.67	6.74
11	6B	4.48	<DL	<DL	1.94	<DL	30	5.32
11	6C	4.83	<DL	<DL	0.2	<DL	24.7	5.33
11	6D	4.85	<DL	<DL	0.656	<DL	40.8	4.36
11	6E	6.34	<DL	<DL	<DL	<DL	28.4	5.14
11	6F	7.11	<DL	<DL	1.2	<DL	29.4	4.4
11	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.93
11	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.65
11	R5	1.33	<DL	<DL	<DL	<DL	0.656	5.47
14	1A	1.97	<DL	<DL	2.22	<DL	2.37	4.16
14	1B	4.5	<DL	<DL	4.19	<DL	22.7	4.28
14	1C	5.3	<DL	<DL	0.114	<DL	30.7	4.58
14	1D	3.88	<DL	<DL	0.656	<DL	23.9	4.18
14	1E	5.1	<DL	0.114	<DL	<DL	24.2	4.38
14	1F	6.44	<DL	<DL	2.19	<DL	19.8	4.06
14	2A	2.19	<DL	<DL	3.48	<DL	8.55	3.95
14	2B	3.68	<DL	<DL	1.82	<DL	29.8	4.02
14	2C	5.87	<DL	<DL	<DL	<DL	43.2	4.28

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
14	2D	5.02	<DL	<DL	1.03	<DL	32.9	4.01
14	2E	4.59	<DL	<DL	<DL	<DL	27.2	4.26
14	2F	5.7	<DL	<DL	0.57	<DL	22.7	4.11
14	3A	2.54	<DL	<DL	8.49	<DL	13.3	4.36
14	3B	2.99	<DL	<DL	1.4	<DL	31.7	4.39
14	3C	4.73	<DL	<DL	0.228	<DL	37.9	4.49
14	3D	5.19	<DL	<DL	0.741	<DL	29.3	4.29
14	3E	5.16	<DL	<DL	<DL	<DL	26.8	4.36
14	3F	5.64	<DL	<DL	1.34	<DL	22.1	4.55
14	4A	1.91	<DL	<DL	1.8	<DL	2.31	4.07
14	4B	3.65	<DL	<DL	2.51	<DL	22	4.27
14	4C	3.96	<DL	<DL	0.342	<DL	25.7	4.38
14	4D	3.62	<DL	<DL	0.485	<DL	25	4.1
14	4E	5.36	<DL	<DL	<DL	<DL	29.1	4.39
14	4F	6.64	<DL	<DL	0.656	<DL	24.1	4.05
14	5A	2.02	<DL	<DL	1.23	<DL	5.39	7.53
14	5B	3.45	<DL	<DL	1.94	<DL	24.5	5.43
14	5C	4.56	<DL	<DL	0.0855	<DL	31.6	5.24
14	5D	4.73	<DL	<DL	0.2	<DL	27.6	5
14	5E	5.19	<DL	<DL	<DL	<DL	25.8	5.14
14	5F	6.93	<DL	<DL	0.599	<DL	24.7	4.95
14	6A	2.37	<DL	<DL	1.28	<DL	4.76	6.67
14	6B	4.47	<DL	<DL	2.59	<DL	29.2	5.06
14	6C	4.96	<DL	<DL	0.342	<DL	25.5	5.04
14	6D	4.65	<DL	<DL	0.513	<DL	42.8	4.46
14	6E	6.13	<DL	<DL	<DL	<DL	27.8	5.08
14	6F	6.33	<DL	<DL	0.741	<DL	25.5	4.82
14	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	8.01
14	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.82
14	R6	1.59	<DL	<DL	<DL	<DL	0.513	5.74
18	1A	1.8	<DL	<DL	2.25	0.57	1.57	4.67
18	1B	4.36	<DL	<DL	6.33	<DL	24.4	4.7
18	1C	5.13	<DL	<DL	0.399	<DL	33.3	4.89
18	1D	3.53	<DL	<DL	1.2	<DL	24.4	5.09
18	1E	5.1	<DL	<DL	<DL	<DL	25.7	5.22
18	1F	6.36	<DL	<DL	1.4	<DL	20.4	4.95
18	2A	2.62	<DL	<DL	7.44	<DL	12.4	4.56
18	2B	3.42	<DL	<DL	2.62	<DL	26.3	4.67
18	2C	4.96	<DL	<DL	<DL	<DL	47.8	4.6
18	2D	4.76	<DL	<DL	0.884	<DL	35.6	4.81
18	2E	4.87	<DL	<DL	<DL	<DL	28.9	5.12
18	2F	5.84	<DL	<DL	0.485	<DL	23.1	4.87

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
18	3A	2.71	<DL	<DL	5.87	<DL	7.13	5.16
18	3B	2.48	<DL	<DL	1.91	<DL	26.5	4.97
18	3C	4.05	<DL	<DL	0.371	<DL	44.3	4.67
18	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
18	3E	5.07	<DL	<DL	<DL	<DL	27.3	5.09
18	3F	5.61	<DL	<DL	1.08	<DL	21.4	5.04
18	4A	1.78	<DL	<DL	0.941	<DL	1.08	4.91
18	4B	3.83	<DL	<DL	4.25	<DL	22.3	4.98
18	4C	3.69	<DL	<DL	0.485	<DL	26.6	5.15
18	4D	3.46	<DL	<DL	0.741	<DL	23.9	4.7
18	4E	5.23	<DL	<DL	<DL	<DL	30.8	5.25
18	4F	6.28	<DL	<DL	0.57	<DL	25.8	4.46
18	5A	3	<DL	<DL	2.99	<DL	6.78	7.29
18	5B	3.06	<DL	<DL	2.59	<DL	19.8	5.51
18	5C	3.74	<DL	<DL	0.2	<DL	35.3	5.14
18	5D	3.89	<DL	<DL	0.314	<DL	30	4.68
18	5E	5.42	<DL	<DL	<DL	<DL	27.2	5.17
18	5F	6.85	<DL	<DL	0.542	<DL	25	4.89
18	6A	4.8	<DL	<DL	3.16	<DL	13.7	5.95
18	6B	3.97	<DL	<DL	3.96	<DL	30.3	5.14
18	6C	4.77	<DL	<DL	0.627	<DL	26.8	5.26
18	6D	4.26	<DL	<DL	0.542	<DL	48.2	4.22
18	6E	5.68	<DL	<DL	<DL	<DL	29	5.09
18	6F	5.85	<DL	<DL	0.542	<DL	27.2	4.49
18	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	8.09
18	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.93
18	R1	1.3	<DL	<DL	<DL	<DL	0.656	5.86
21	1A	2.12	<DL	<DL	2.54	<DL	1.31	4.64
21	1B	3.34	<DL	<DL	7.55	<DL	19.6	4.61
21	1C	4.74	<DL	<DL	1.11	<DL	32.8	5.02
21	1D	3.63	<DL	<DL	1.82	<DL	23.2	5.01
21	1E	4.94	<DL	<DL	<DL	<DL	27.4	4.99
21	1F	6.31	<DL	0.114	0.941	<DL	21.3	4.87
21	2A	2.52	<DL	<DL	5.33	<DL	7.44	4.67
21	2B	3.03	<DL	<DL	3.65	<DL	22.3	4.59
21	2C	4.37	<DL	<DL	0.0855	<DL	49.8	4.78
21	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.76
21	2E	4.85	<DL	0.114	<DL	<DL	29.4	5
21	2F	6.02	<DL	<DL	0.371	<DL	23.5	4.87
21	3A	3.29	<DL	<DL	9.52	<DL	11	4.6
21	3B	2.29	<DL	<DL	2.17	<DL	20.9	4.93
21	3C	3.26	<DL	<DL	0.599	<DL	45.5	5.15

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
21	3D	4.11	<DL	<DL	0.884	<DL	39	4.85
21	3E	5.03	<DL	0.114	<DL	<DL	33.2	5.01
21	3F	5.65	<DL	<DL	0.77	<DL	22.6	5.45
21	4A	2.09	<DL	<DL	1.71	<DL	1.34	4.59
21	4B	3.14	<DL	<DL	4.85	<DL	23.2	4.85
21	4C	3.86	<DL	<DL	1.62	<DL	26.3	5.01
21	4D	3.23	<DL	<DL	1.14	<DL	24.7	4.88
21	4E	5.08	<DL	<DL	<DL	<DL	32.8	5.05
21	4F	6.05	<DL	<DL	0.371	<DL	25.3	4.84
21	5A	3.26	<DL	<DL	2.02	<DL	7.21	7.16
21	5B	2.55	<DL	<DL	4.02	<DL	19	5.35
21	5C	3.43	<DL	<DL	0.257	<DL	38.3	5.16
21	5D	3.49	<DL	<DL	0.428	<DL	31.9	5
21	5E	5.62	<DL	0.114	<DL	<DL	28.7	5.03
21	5F	6.59	<DL	<DL	0.371	<DL	25.3	5.03
21	6A	2.29	<DL	<DL	2.37	<DL	4.93	6.53
21	6B	3.23	<DL	<DL	4.65	<DL	28.8	4.94
21	6C	4.63	<DL	<DL	1.34	<DL	29	4.95
21	6D	4.28	<DL	<DL	0.428	<DL	56.8	4.34
21	6E	5.68	<DL	<DL	<DL	<DL	30.6	5.04
21	6F	5.99	<DL	<DL	0.456	<DL	25.8	4.88
21	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.62
21	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.68
21	R2	1.47	<DL	<DL	<DL	<DL	0.57	6.13
25	1A	2.06	<DL	<DL	3.96	<DL	1.4	4.54
25	1B	2.75	<DL	<DL	9.8	<DL	15.3	4.55
25	1C	4.11	<DL	<DL	1.48	<DL	35	5.03
25	1D	3.03	<DL	<DL	2.79	<DL	24.8	5.31
25	1E	4.57	<DL	<DL	<DL	<DL	31.3	5.02
25	1F	5.97	<DL	<DL	0.827	<DL	23.5	4.91
25	2A	2.63	<DL	<DL	6.95	<DL	7.32	4.8
25	2B	2.75	<DL	<DL	5.39	<DL	21	4.52
25	2C	3.77	<DL	<DL	0.228	<DL	51.5	4.75
25	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
25	2E	4.77	<DL	<DL	<DL	<DL	34.9	5
25	2F	6.08	<DL	<DL	0.342	<DL	26.1	4.99
25	3A	2.38	<DL	<DL	5.76	<DL	5.93	4.89
25	3B	2.06	<DL	<DL	4.28	<DL	20	4.9
25	3C	2.95	<DL	<DL	0.941	<DL	47.8	5.15
25	3D	3.06	<DL	<DL	0.171	<DL	32.2	5.45
25	3E	4.88	<DL	<DL	<DL	<DL	40.1	5.17
25	3F	5.48	<DL	<DL	0.741	<DL	24.4	5.68

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
25	4A	2.43	<DL	<DL	2.71	<DL	1.25	4.82
25	4B	2.57	<DL	<DL	6.13	<DL	20	4.87
25	4C	3.43	<DL	<DL	2.68	<DL	27.6	5.01
25	4D	3.14	<DL	<DL	1.94	<DL	26	5.04
25	4E	4.71	<DL	<DL	<DL	<DL	36.7	5.1
25	4F	5.54	<DL	<DL	0.399	<DL	28	4.95
25	5A	2.63	<DL	<DL	1.97	<DL	5.61	7.25
25	5B	2.8	<DL	<DL	31.3	<DL	21	5.13
25	5C	3.23	<DL	<DL	0.342	<DL	42	5.16
25	5D	3.32	<DL	<DL	0.684	<DL	35.1	5.1
25	5E	5.34	<DL	<DL	<DL	<DL	33.1	5.02
25	5F	6.19	<DL	0.114	0.371	<DL	27.3	5.01
25	6A	2.92	0.143	<DL	5.5	<DL	6.75	6.03
25	6B	2.75	<DL	<DL	6.95	<DL	25.7	4.96
25	6C	3.97	<DL	<DL	1.88	<DL	33.6	4.97
25	6D	3.69	<DL	<DL	0.057	<DL	65.5	4.04
25	6E	5.08	<DL	<DL	<DL	<DL	35.4	4.99
25	6F	5.45	<DL	<DL	0.342	<DL	29	4.85
25	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	8.06
25	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.79
25	R3	1.3	<DL	<DL	<DL	<DL	0.798	5.25
28	1A	2	<DL	<DL	5.02	<DL	1.23	4.5
28	1B	2.52	<DL	<DL	11.3	<DL	12.5	4.57
28	1C	3.4	<DL	<DL	3.85	<DL	32.5	5.09
28	1D	2.92	<DL	<DL	4.08	<DL	24.2	5.47
28	1E	4.2	<DL	<DL	<DL	<DL	32.9	5.13
28	1F	5.74	<DL	<DL	0.627	<DL	24.3	5.28
28	2A	2.09	<DL	<DL	4.39	<DL	4.02	5.07
28	2B	2.38	<DL	<DL	6.36	<DL	18.4	4.62
28	2C	3.06	<DL	<DL	0.627	<DL	46.6	4.8
28	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
28	2E	4.54	<DL	<DL	<DL	<DL	35.1	5.13
28	2F	5.94	<DL	<DL	0.228	<DL	27	5.25
28	3A	2.15	<DL	<DL	4.67	<DL	3.51	5.1
28	3B	1.98	<DL	<DL	6.81	<DL	16.2	4.92
28	3C	2.43	<DL	<DL	2.02	<DL	44.2	5.23
28	3D	3.03	<DL	<DL	0.342	<DL	37.8	5.56
28	3E	4.46	<DL	0.114	<DL	<DL	42.6	5.24
28	3F	5.25	<DL	<DL	0.485	<DL	25.6	5.78
28	4A	1.74	<DL	<DL	2.14	<DL	0.969	4.97
28	4B	2.28	<DL	<DL	6.9	<DL	17	4.92
28	4C	2.94	<DL	<DL	3.82	<DL	26.6	5.07

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
28	4D	2.79	<DL	<DL	3.02	<DL	25.5	5.14
28	4E	4.39	<DL	<DL	<DL	<DL	38.4	5.22
28	4F	5.3	<DL	<DL	0.285	<DL	27.8	5.16
28	5A	2.05	<DL	<DL	1.68	<DL	3.99	6.82
28	5B	2.45	<DL	<DL	7.58	<DL	19.4	5.14
28	5C	2.99	<DL	<DL	1.28	<DL	41.3	5.2
28	5D	3.08	<DL	<DL	1.03	<DL	36.6	5.09
28	5E	5.02	<DL	<DL	<DL	<DL	34.8	5.07
28	5F	6.1	<DL	<DL	0.285	<DL	28.3	5.1
28	6A	2.25	0.171	<DL	5.02	<DL	7.92	6.12
28	6B	2.42	<DL	<DL	10.6	<DL	20	4.94
28	6C	3.33	<DL	<DL	3.31	<DL	33.3	5.01
28	6D	3.28	<DL	<DL	1.08	<DL	62.3	4.27
28	6E	4.73	<DL	0.143	<DL	<DL	36.1	5.05
28	6F	5.1	<DL	<DL	0.285	<DL	29.4	5
28	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.61
28	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.62
28	R4	1.33	<DL	<DL	<DL	<DL	0.884	5.14
32	1A	2.08	<DL	<DL	8.75	0.58	1.51	4.23
32	1B	2.25	<DL	<DL	13.1	<DL	10.7	4.49
32	1C	2.94	<DL	<DL	5.44	<DL	30.7	4.99
32	1D	2.48	<DL	<DL	5.42	<DL	20.9	5.38
32	1E	3.82	<DL	0.114	<DL	<DL	34.1	5.08
32	1F	5.24	<DL	0.114	0.314	<DL	25.2	5.11
32	2A	1.82	<DL	<DL	6.81	<DL	4.13	5.2
32	2B	2.17	<DL	<DL	8.04	<DL	16.9	4.52
32	2C	2.68	<DL	<DL	1.34	<DL	45.7	4.83
32	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
32	2E	4.45	<DL	0.114	<DL	<DL	40.1	5.08
32	2F	5.59	<DL	0.143	0.371	<DL	28.2	5.08
32	3A	1.88	<DL	<DL	7.44	<DL	3.42	5
32	3B	1.91	<DL	<DL	10.6	<DL	13.7	4.79
32	3C	2.05	<DL	<DL	3.56	<DL	39	5.18
32	3D	2.48	<DL	<DL	1.08	<DL	35.4	5.42
32	3E	4.02	<DL	<DL	<DL	<DL	45.4	5.33
32	3F	4.76	<DL	0.114	0.171	<DL	26.2	5.63
32	4A	1.71	<DL	<DL	3.39	<DL	0.941	4.55
32	4B	2.08	<DL	<DL	8.46	<DL	13.7	4.84
32	4C	2.65	<DL	<DL	4.96	<DL	25.6	5.02
32	4D	2.48	<DL	<DL	4.13	<DL	23.8	4.93
32	4E	4.08	<DL	<DL	<DL	<DL	40.1	5.11
32	4F	4.9	<DL	0.114	0.2	<DL	28.4	5.05

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
32	5A	1.8	<DL	<DL	1.34	<DL	2.48	6.73
32	5B	2.37	<DL	<DL	10.5	<DL	16.8	4.99
32	5C	2.82	<DL	<DL	2.59	<DL	39.2	5.08
32	5D	2.85	<DL	<DL	2.28	<DL	35.9	4.94
32	5E	4.9	<DL	<DL	<DL	<DL	36.6	5.01
32	5F	5.79	<DL	0.143	0.2	<DL	28.6	4.97
32	6A	2.08	0.2	<DL	11.2	<DL	9.66	5.7
32	6B	2.57	<DL	<DL	18.2	<DL	16.6	4.69
32	6C	3.08	<DL	<DL	4.45	<DL	32.3	4.89
32	6D	3.08	<DL	<DL	0.399	<DL	66.6	4.05
32	6E	4.36	<DL	0.143	<DL	<DL	37.3	4.93
32	6F	4.9	<DL	<DL	0.371	<DL	29.5	4.89
32	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.97
32	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.78
32	R5	1.33	<DL	<DL	<DL	<DL	1.14	4.93
35	1A	3.47	<DL	<DL	7.3	<DL	1.6	4.05
35	1B	2.98	<DL	<DL	14.7	<DL	8.81	4.27
35	1C	4.21	<DL	<DL	6.73	<DL	25.6	4.81
35	1D	2.7	<DL	<DL	6.95	<DL	18.6	4.96
35	1E	5.04	<DL	<DL	0.057	<DL	31.9	5.04
35	1F	5.15	<DL	0.143	0.399	<DL	22.8	5.03
35	2A	<DL	<DL	<DL	<DL	<DL	0.713	5.38
35	2B	4.81	<DL	<DL	9.03	<DL	13.1	4.5
35	2C	5.01	<DL	<DL	2.17	<DL	36.5	4.76
35	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
35	2E	5.95	<DL	0.114	0.057	<DL	37.8	4.98
35	2F	5.72	<DL	0.143	0.513	<DL	26.8	4.92
35	3A	2.67	<DL	<DL	7.07	<DL	2.37	4.83
35	3B	4.95	<DL	<DL	10.7	<DL	10.6	4.69
35	3C	3.33	<DL	<DL	5.64	<DL	30	4.97
35	3D	6.6	<DL	<DL	2.68	<DL	25.7	5.31
35	3E	8.4	<DL	0.143	0.0855	<DL	55.7	4.11
35	3F	4.98	<DL	0.114	0.285	<DL	25.2	5.19
35	4A	1.84	<DL	<DL	2.45	<DL	1.05	4.52
35	4B	3.3	<DL	<DL	8.86	<DL	11.5	4.7
35	4C	4.21	<DL	<DL	5.76	<DL	23	4.94
35	4D	2.27	<DL	<DL	5.64	<DL	21.7	4.91
35	4E	5.75	<DL	<DL	0.057	<DL	38.6	5.08
35	4F	4.81	<DL	<DL	0.314	<DL	26	5.05
35	5A	3.95	<DL	<DL	1.17	<DL	1.65	6.72
35	5B	8.74	<DL	<DL	11.7	<DL	14.2	5.03
35	5C	4.29	<DL	<DL	3.79	<DL	33.5	5.15

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
35	5D	2.58	<DL	<DL	3.68	<DL	30.8	5.06
35	5E	5.72	<DL	<DL	0.057	<DL	34.3	5.03
35	5F	5.69	<DL	<DL	0.285	<DL	25.9	5.09
35	6A	3.52	<DL	<DL	7.41	<DL	8.86	5.5
35	6B	3.52	<DL	<DL	17.7	<DL	13.1	4.8
35	6C	4.75	<DL	<DL	9.21	<DL	24.5	4.87
35	6D	2.9	0.057	<DL	1.65	<DL	54.7	4.41
35	6E	5.32	<DL	<DL	0.0855	<DL	35	4.98
35	6F	4.64	<DL	0.114	0.314	<DL	26.6	5.01
35	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.46
35	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.47
35	R6	1.53	<DL	<DL	<DL	<DL	1.14	5.24
39	1A	5.92	<DL	<DL	9.09	0.608	1.6	4.1
39	1B	6.32	<DL	<DL	14.7	<DL	8.24	4.18
39	1C	4.69	<DL	<DL	8.35	<DL	23.6	4.86
39	1D	2.98	<DL	<DL	8.35	<DL	16.7	5.12
39	1E	5.32	<DL	<DL	<DL	<DL	33.1	5
39	1F	4.61	<DL	<DL	0.314	<DL	24	5.11
39	2A	2.84	<DL	<DL	10.2	<DL	3.71	4.81
39	2B	5.41	<DL	<DL	11.6	<DL	13.1	4.29
39	2C	5.58	<DL	<DL	3.59	<DL	34.7	4.75
39	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
39	2E	10.2	<DL	0.143	<DL	<DL	40.2	4.96
39	2F	4.95	<DL	0.114	0.314	<DL	27.6	5.04
39	3A	2.73	<DL	<DL	12.3	<DL	3.39	4.42
39	3B	4.95	<DL	<DL	10.9	<DL	10.2	4.57
39	3C	3.38	<DL	<DL	5.64	<DL	30.4	5.04
39	3D	5.46	<DL	<DL	4.65	<DL	25.4	5.29
39	3E	8.51	<DL	<DL	<DL	<DL	56.8	4.98
39	3F	4.41	<DL	0.114	0.257	<DL	26.3	5.49
39	4A	2.42	<DL	<DL	4.3	<DL	1.05	4.4
39	4B	3.36	<DL	<DL	12.5	<DL	7.35	4.51
39	4C	2.88	<DL	<DL	7.7	<DL	21.1	4.83
39	4D	2.68	<DL	<DL	6.44	<DL	21.7	4.89
39	4E	4.5	<DL	<DL	<DL	<DL	42.1	5.05
39	4F	4.5	<DL	<DL	0.285	<DL	28.4	5.01
39	5A	7.81	<DL	<DL	1.17	<DL	1.4	7.05
39	5B	8.72	<DL	<DL	15.6	<DL	12.8	4.82
39	5C	3.45	<DL	<DL	4.96	<DL	34.9	5.12
39	5D	2.59	<DL	<DL	4.5	<DL	32.6	5.04
39	5E	5.61	<DL	<DL	0.057	<DL	39.1	4.98
39	5F	4.93	<DL	<DL	0.257	<DL	29.2	5.09

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
39	6A	13.1	<DL	<DL	14.7	<DL	6.21	5.71
39	6B	4.53	<DL	<DL	19	<DL	11.8	4.72
39	6C	3.56	<DL	<DL	12.3	<DL	23.4	4.77
39	6D	2.76	0.057	<DL	4.56	<DL	54.4	4.35
39	6E	4.16	<DL	<DL	0.0855	<DL	38.7	4.89
39	6F	4.36	<DL	<DL	0.371	<DL	32.7	4.9
39	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.59
39	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.65
39	R1	1.73	<DL	<DL	<DL	<DL	1.03	5.16
42	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.8
42	1B	5.59	<DL	<DL	16.4	<DL	6.9	4.24
42	1C	2.94	<DL	<DL	10.5	<DL	22.6	4.74
42	1D	2.51	<DL	<DL	9.75	<DL	17.9	4.97
42	1E	4.85	<DL	<DL	0.0855	<DL	37.9	4.94
42	1F	3.99	<DL	0.114	0.257	<DL	28.4	5.12
42	2A	2.48	<DL	<DL	9.52	<DL	3.82	4.67
42	2B	2.96	<DL	<DL	13.1	<DL	12.8	4.27
42	2C	3.16	<DL	<DL	5.27	<DL	33.3	4.68
42	2D	8.21	0.143	<DL	7.24	<DL	30.7	4.78
42	2E	4.96	<DL	<DL	0.057	<DL	45.5	4.91
42	2F	4.5	<DL	<DL	0.257	<DL	33.3	4.98
42	3A	2.99	<DL	<DL	11.6	<DL	4.13	4.39
42	3B	2.76	<DL	<DL	10.8	<DL	10.4	4.52
42	3C	2.99	<DL	<DL	8.07	<DL	26.5	4.87
42	3D	5.67	<DL	<DL	6.61	<DL	22.1	5.17
42	3E	6.24	<DL	0.114	<DL	<DL	55.9	4.95
42	3F	4.28	<DL	<DL	0.257	<DL	28.5	5.53
42	4A	2.51	<DL	<DL	2.08	<DL	0.827	4.57
42	4B	2.94	<DL	<DL	13.3	<DL	6.87	4.43
42	4C	5.7	<DL	<DL	9.86	<DL	19.5	4.81
42	4D	2.11	<DL	<DL	8.41	<DL	20.9	4.9
42	4E	4.22	<DL	<DL	<DL	<DL	44.3	5.03
42	4F	4.02	<DL	<DL	0.257	<DL	29.5	5.17
42	5A	2.65	<DL	<DL	0.884	<DL	1.2	6.31
42	5B	7.44	<DL	<DL	18.4	<DL	13.5	4.72
42	5C	3.36	0.057	<DL	7.44	<DL	32.1	5.05
42	5D	2.45	<DL	<DL	6.3	<DL	30.1	5.1
42	5E	5.39	<DL	<DL	0.057	<DL	41.8	5.01
42	5F	4.79	<DL	<DL	0.257	<DL	30.3	5.12
42	6A	2.48	<DL	<DL	8.07	<DL	4.28	5.44
42	6B	3.11	<DL	<DL	21.5	<DL	11.5	4.64
42	6C	5.39	<DL	<DL	14.4	<DL	21.8	4.76

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
42	6D	2.37	0.0855	<DL	6.84	<DL	37.6	4.72
42	6E	6.27	<DL	<DL	0.057	<DL	40.6	4.93
42	6F	3.9	<DL	<DL	0.314	<DL	30.4	5.08
42	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.95
42	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.05
42	R2	1.9	<DL	<DL	<DL	<DL	1.14	5.29
47	1A	19.3	<DL	<DL	14.2	<DL	2.2	4.73
47	1B	5.55	<DL	<DL	16.2	<DL	7.15	4.15
47	1C	5.98	<DL	<DL	10.1	<DL	22.5	4.86
47	1D	2.81	<DL	<DL	9.46	<DL	15.7	5.01
47	1E	3.95	<DL	<DL	0.057	<DL	38.4	5.05
47	1F	4.04	<DL	<DL	0.228	<DL	30	5.14
47	2A	2.95	0.057	<DL	15.8	<DL	5.73	4.43
47	2B	3.3	<DL	<DL	16.9	<DL	13.3	4.1
47	2C	5.21	<DL	<DL	6.73	<DL	29.8	4.73
47	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
47	2E	6.46	<DL	<DL	<DL	<DL	47	4.89
47	2F	3.9	<DL	<DL	0.228	<DL	36.3	5
47	3A	6.6	<DL	<DL	7.72	<DL	2.34	5.45
47	3B	3.81	<DL	<DL	12.7	<DL	10.3	4.58
47	3C	4.55	<DL	<DL	7.58	<DL	24.9	5.11
47	3D	6.03	<DL	<DL	7.5	<DL	23.5	5
47	3E	9.05	<DL	0.114	<DL	<DL	46.5	4.75
47	3F	3.47	0.2	<DL	0.371	<DL	28.9	5.44
47	4A	1.96	<DL	<DL	2.08	0.57	0.77	4.56
47	4B	3.1	<DL	<DL	14.6	<DL	6.36	4.31
47	4C	2.95	<DL	<DL	10.4	<DL	18.7	4.7
47	4D	2.27	<DL	<DL	9.18	<DL	20.4	4.74
47	4E	4.66	<DL	<DL	<DL	<DL	44.8	4.98
47	4F	3.78	<DL	<DL	0.342	<DL	30.2	5.09
47	5A	3.07	<DL	<DL	2.34	<DL	1.6	6.28
47	5B	6.66	<DL	<DL	22	<DL	13.9	4.46
47	5C	3.41	0.057	<DL	8.81	<DL	29.6	4.95
47	5D	2.47	<DL	<DL	7.84	<DL	27	5.01
47	5E	4.72	<DL	<DL	0.0855	<DL	42.8	4.98
47	5F	4.66	<DL	<DL	0.228	<DL	31.3	5.07
47	6A	2.36	<DL	<DL	8.15	<DL	5.39	5.28
47	6B	4.12	<DL	<DL	22.4	<DL	11.4	4.47
47	6C	2.76	<DL	<DL	14.6	<DL	22.2	4.7
47	6D	2.95	0.0855	<DL	5.96	<DL	36.9	4.83
47	6E	5.52	<DL	<DL	<DL	<DL	41.2	4.96
47	6F	3.61	<DL	<DL	0.428	<DL	31.5	5.09

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
47	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	8.33
47	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	8.29
47	R3	1.67	<DL	<DL	<DL	<DL	1.11	5.23
49	1A	4.32	<DL	<DL	4.56	0.57	1.54	4.25
49	1B	9.71	<DL	<DL	15.4	<DL	8.01	3.94
49	1C	4.15	<DL	<DL	12.1	<DL	19.6	4.65
49	1D	2.38	<DL	<DL	10.9	<DL	15.6	4.82
49	1E	2.41	<DL	<DL	10.9	<DL	15.9	4.88
49	1F	3.44	<DL	<DL	0.171	<DL	31.4	5.02
49	2A	3.78	<DL	<DL	0.114	<DL	40	4.22
49	2B	2.81	<DL	<DL	15.6	<DL	12.2	3.95
49	2C	4.15	<DL	<DL	8.32	<DL	26.9	4.57
49	2D	3.95	0.0855	<DL	11.7	<DL	22.1	4.87
49	2E	4.18	<DL	<DL	<DL	<DL	48.5	4.9
49	2F	3.7	<DL	0.114	0.171	<DL	37.6	4.83
49	3A	5.78	<DL	<DL	5.36	<DL	2.02	5.06
49	3B	10.2	<DL	<DL	9.43	<DL	9.78	4.43
49	3C	2.47	0.057	<DL	9.01	<DL	21.8	4.79
49	3D	2.9	0.057	<DL	9.66	<DL	23.2	4.75
49	3E	5.58	<DL	<DL	<DL	<DL	49.1	4.63
49	3F	4.09	<DL	<DL	0.371	<DL	31.6	5.32
49	4A	2.38	<DL	<DL	1.57	0.589	0.485	4.56
49	4B	3.07	<DL	<DL	12.3	<DL	5.07	4.3
49	4C	2.76	<DL	<DL	11.3	<DL	15.4	4.6
49	4D	2.33	<DL	<DL	10.2	<DL	15.7	4.7
49	4E	4.24	<DL	<DL	<DL	<DL	44.2	4.92
49	4F	3.67	<DL	<DL	0.371	<DL	27.5	5.02
49	5A	3.33	0.114	<DL	1.6	<DL	1.45	6.23
49	5B	7.46	<DL	<DL	16	<DL	12.3	4.25
49	5C	3.18	<DL	<DL	12.2	<DL	23.5	4.78
49	5D	2.3	<DL	<DL	10.3	<DL	21.5	4.81
49	5E	4.84	<DL	<DL	0.257	<DL	40.6	4.87
49	5F	4.07	<DL	<DL	0.228	<DL	28.2	5.06
49	6A	8.8	<DL	<DL	6.61	<DL	4.53	5.49
49	6B	3.84	<DL	<DL	17.3	<DL	10.4	4.4
49	6C	2.61	<DL	<DL	15.9	<DL	17.8	4.59
49	6D	2.73	0.057	<DL	9.23	<DL	30.5	4.71
49	6E	2.98	<DL	<DL	0.228	<DL	0.941	4.9
49	6F	3.3	<DL	<DL	0.485	<DL	28.1	5.02
49	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.85
49	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.92
49	R4	1.76	<DL	<DL	<DL	<DL	1.23	5.2

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
53	1A	3.42	<DL	<DL	3.59	0.676	1.11	4.15
53	1B	3.85	<DL	<DL	13.5	<DL	6.66	4
53	1C	8.29	<DL	<DL	11.7	<DL	19.1	4.84
53	1D	3.4	<DL	<DL	10.6	<DL	13.5	4.67
53	1E	3.81	<DL	<DL	<DL	<DL	39.9	4.9
53	1F	3.92	<DL	<DL	<DL	<DL	32.1	4.87
53	2A	3.32	<DL	<DL	11.5	<DL	5.29	4.14
53	2B	3.58	<DL	<DL	17.6	<DL	12	3.94
53	2C	<DL	<DL	<DL	8.75	<DL	24.4	4.59
53	2D	6.16	<DL	<DL	9.97	<DL	16.7	4.55
53	2E	4.1	<DL	<DL	<DL	<DL	50.1	4.82
53	2F	3.79	<DL	<DL	<DL	<DL	38.8	4.73
53	3A	3.01	<DL	<DL	6.54	<DL	4.12	4.52
53	3B	3.62	<DL	<DL	9.22	<DL	9.86	4.46
53	3C	6.33	<DL	<DL	7.59	<DL	20.7	4.97
53	3D	4.03	<DL	<DL	8.92	<DL	17.5	4.54
53	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.68
53	3F	3.51	<DL	<DL	0.312	<DL	31.3	5.21
53	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.24
53	4B	7.22	<DL	<DL	13.8	<DL	5.38	4.17
53	4C	3.38	<DL	<DL	10.4	<DL	16.9	4.65
53	4D	2.34	<DL	<DL	10.5	<DL	16.4	4.57
53	4E	3.79	<DL	<DL	<DL	<DL	46.7	4.89
53	4F	3.76	<DL	<DL	0.409	<DL	29.6	4.84
53	5A	6.8	0.36	<DL	5.32	<DL	2.23	6.22
53	5B	5.23	<DL	<DL	27.5	<DL	14.4	4.13
53	5C	4.91	<DL	<DL	13.6	<DL	23.3	4.86
53	5D	2.64	<DL	<DL	12.6	<DL	20.5	4.63
53	5E	4.12	<DL	<DL	0.133	<DL	42.3	4.89
53	5F	3.83	<DL	<DL	0.177	<DL	31.1	4.9
53	6A	3.6	<DL	<DL	6.14	<DL	4.82	4.95
53	6B	4.05	<DL	<DL	21.9	<DL	12	4.32
53	6C	3.35	<DL	<DL	18	<DL	19.1	4.56
53	6D	2.32	<DL	<DL	9.36	<DL	32.6	4.57
53	6E	3.58	<DL	<DL	<DL	<DL	42.7	4.9
53	6F	3.21	<DL	<DL	0.564	<DL	30.5	4.88
53	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.04
53	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.14
53	R5	1.67	<DL	<DL	<DL	<DL	1.2	5.05
56	1A	2.87	<DL	<DL	4.19	0.69	1.67	4.07
56	1B	2.88	<DL	<DL	12.3	<DL	7.48	3.94
56	1C	10.6	<DL	<DL	10.9	<DL	18.3	4.78

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
56	1D	6.29	<DL	<DL	11.3	<DL	11.8	4.83
56	1E	4.38	<DL	<DL	<DL	<DL	40.1	4.92
56	1F	3.26	<DL	<DL	<DL	<DL	32.2	5.02
56	2A	3.56	<DL	<DL	8.73	<DL	5.21	4.23
56	2B	2.88	<DL	<DL	15.9	<DL	12.1	3.93
56	2C	2.57	<DL	<DL	13.3	<DL	36.3	4.58
56	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
56	2E	4.04	<DL	<DL	0.0929	<DL	49.9	4.8
56	2F	4.18	<DL	<DL	<DL	<DL	42.2	4.74
56	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.61
56	3B	4.74	<DL	<DL	18.7	<DL	12.5	4.4
56	3C	2.75	<DL	<DL	17.5	<DL	19.3	4.8
56	3D	2.46	<DL	<DL	8.25	<DL	30.5	4.49
56	3E	3.12	<DL	<DL	<DL	<DL	43.3	4.61
56	3F	2.97	<DL	<DL	0.757	<DL	31.5	5.36
56	4A	3.19	<DL	<DL	3.53	0.656	0.998	4.17
56	4B	8.86	<DL	<DL	12	<DL	5.13	4.19
56	4C	10.9	<DL	<DL	10.4	<DL	15.1	4.71
56	4D	2.39	<DL	<DL	10.4	<DL	15	4.49
56	4E	7.38	<DL	<DL	0.143	<DL	43.7	4.95
56	4F	3.31	<DL	<DL	0.884	<DL	27.4	4.93
56	5A	9.41	0.855	<DL	5.1	<DL	1.85	6.19
56	5B	4.45	<DL	<DL	12	<DL	13.5	4.08
56	5C	2.74	0.0855	<DL	14.8	<DL	19.5	4.69
56	5D	2.65	<DL	<DL	13.5	<DL	17.8	4.56
56	5E	3.51	<DL	<DL	0.713	<DL	38.9	4.82
56	5F	3.73	<DL	<DL	0.542	<DL	29.2	4.94
56	6A	6.64	<DL	<DL	5.61	<DL	6.3	5.18
56	6B	4.73	<DL	<DL	16.2	<DL	10.9	4.33
56	6C	2.82	<DL	<DL	15.6	<DL	18.1	4.53
56	6D	2.57	<DL	<DL	8.61	<DL	28.8	4.65
56	6E	3.39	<DL	<DL	<DL	<DL	41.3	4.83
56	6F	3.02	<DL	<DL	1.08	<DL	29.7	4.92
56	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.09
56	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.13
56	R6	1.59	<DL	<DL	<DL	<DL	1.2	4.91
60	1A	12.2	<DL	<DL	2.54	1.24	0.78	4.17
60	1B	3.16	<DL	<DL	11.1	<DL	5.96	3.98
60	1C	2.94	<DL	<DL	10.1	<DL	17.2	4.58
60	1D	3.16	<DL	<DL	11.2	<DL	10.3	4.51
60	1E	3.9	<DL	<DL	<DL	<DL	39.6	4.81
60	1F	3.53	<DL	<DL	0.114	<DL	32.9	4.85

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
60	2A	8.18	<DL	<DL	7.92	<DL	5.1	4.14
60	2B	3.56	<DL	<DL	15	<DL	11.7	3.94
60	2C	2.65	<DL	<DL	9.8	<DL	20	4.53
60	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.83
60	2E	4.7	<DL	<DL	0.741	<DL	47.5	4.85
60	2F	3.33	<DL	<DL	0.171	<DL	40.8	4.72
60	3A	5.72	<DL	<DL	4.81	<DL	4.03	4.63
60	3B	3.31	<DL	<DL	8.38	<DL	9.72	4.42
60	3C	3.62	<DL	<DL	7.47	<DL	18.4	4.77
60	3D	5.59	<DL	<DL	8.55	<DL	16.4	4.44
60	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.54
60	3F	3.33	<DL	<DL	0.599	<DL	32.5	4.93
60	4A	5.84	<DL	<DL	4.3	0.599	1.17	4.18
60	4B	5.07	<DL	<DL	12.7	<DL	6.3	4.11
60	4C	3.11	<DL	<DL	10.5	<DL	15.5	4.54
60	4D	2.54	<DL	<DL	10.7	<DL	14.4	4.5
60	4E	4.1	<DL	0.114	0.342	<DL	43.4	4.83
60	4F	3.56	<DL	<DL	1.31	<DL	26.7	4.84
60	5A	15	0.77	<DL	8.81	<DL	2.71	6.18
60	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.05
60	5C	3.19	<DL	<DL	15.7	<DL	18.4	4.61
60	5D	3.16	<DL	<DL	14.6	<DL	16.9	4.49
60	5E	5.73	<DL	<DL	1.23	<DL	38.3	4.78
60	5F	3.65	<DL	<DL	0.884	<DL	29.6	4.91
60	6A	9.32	<DL	<DL	6.56	<DL	5.87	5.24
60	6B	5.87	<DL	<DL	15.9	<DL	11.2	4.27
60	6C	2.99	<DL	<DL	15.1	<DL	16.8	4.52
60	6D	3.05	<DL	<DL	7.32	<DL	28.9	4.66
60	6E	3.71	<DL	<DL	0.0855	<DL	41.5	4.83
60	6F	3.25	<DL	<DL	1.48	<DL	29.7	4.9
60	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.96
60	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.99
60	R1	1.5	<DL	<DL	<DL	<DL	1.05	5.17
63	1A	5.2	<DL	<DL	3.85	0.703	1.4	4.09
63	1B	4.14	<DL	<DL	10	<DL	5.44	3.99
63	1C	5.74	0.0855	<DL	8.95	<DL	15.2	4.69
63	1D	2.63	0.0855	<DL	11.5	<DL	10.7	4.51
63	1E	4.2	<DL	<DL	0.114	<DL	36.9	4.78
63	1F	3.17	<DL	<DL	0.171	<DL	32.5	4.83
63	2A	2.72	<DL	<DL	5.59	<DL	3.82	4.24
63	2B	4.31	<DL	<DL	14.7	<DL	10.3	3.94
63	2C	6.76	0.114	<DL	9.86	<DL	17.3	4.62

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
63	2D	3.83	0.114	<DL	13.4	<DL	11.3	4.36
63	2E	4.97	<DL	<DL	1.2	<DL	42.1	4.68
63	2F	3.23	<DL	<DL	0.428	<DL	40.1	4.62
63	3A	2.95	<DL	<DL	5.9	<DL	4.13	4.36
63	3B	4.4	<DL	<DL	7.75	<DL	8.72	4.34
63	3C	3.69	<DL	<DL	7.07	<DL	17.4	4.69
63	3D	5.71	<DL	<DL	8.72	<DL	16.8	4.27
63	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
63	3F	3.86	<DL	<DL	0.684	<DL	31.7	5.09
63	4A	7.33	<DL	<DL	3.68	<DL	1.23	4.16
63	4B	4.34	<DL	<DL	12.5	<DL	6.3	4.05
63	4C	3.46	<DL	<DL	11.1	<DL	14	4.48
63	4D	2.83	0.0855	<DL	11.1	<DL	12.7	4.35
63	4E	4.28	<DL	<DL	0.627	<DL	40.5	4.7
63	4F	3.23	<DL	<DL	1.85	<DL	25.9	4.77
63	5A	16.8	0.314	<DL	6.01	<DL	2.31	6.16
63	5B	8.76	0.0855	<DL	17	<DL	12.9	4.04
63	5C	3.86	0.114	<DL	16.8	<DL	16.1	4.53
63	5D	2.52	0.114	<DL	15.4	<DL	16	4.41
63	5E	4.06	<DL	<DL	1.85	<DL	33.9	4.7
63	5F	3.37	<DL	<DL	1.28	<DL	29.2	4.82
63	6A	2.92	<DL	<DL	5.3	<DL	9.86	4.83
63	6B	4.31	<DL	<DL	15	<DL	11	4.2
63	6C	3.57	0.0855	<DL	14.7	<DL	16.6	4.48
63	6D	2.18	0.114	<DL	6.64	<DL	27.6	4.63
63	6E	3.74	<DL	<DL	0.114	<DL	39.6	4.76
63	6F	2.95	<DL	<DL	1.88	<DL	29.3	4.78
63	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.9
63	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.99
63	R2	1.67	<DL	<DL	<DL	<DL	0.285	4.88
67	1A	2.55	<DL	<DL	2.88	<DL	1.4	4.09
67	1B	8.1	<DL	<DL	10.8	<DL	6.44	3.94
67	1C	7.82	0.0855	<DL	8.12	<DL	17.6	4.76
67	1D	2.86	0.0855	<DL	11.9	<DL	10	4.43
67	1E	3.66	<DL	<DL	0.171	<DL	36.1	4.78
67	1F	3.17	<DL	<DL	0.285	<DL	33	4.78
67	2A	2.26	<DL	<DL	6.07	<DL	4.3	4.2
67	2B	3.57	<DL	<DL	14.5	<DL	10.9	3.95
67	2C	2.92	0.0855	<DL	9.35	<DL	17.6	4.54
67	2D	4.26	0.0855	<DL	15	<DL	12.7	4.33
67	2E	4.26	<DL	<DL	1.82	<DL	40.2	4.72
67	2F	3.12	<DL	<DL	0.513	<DL	40.7	4.62

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
67	3A	3.97	<DL	<DL	6.41	<DL	4.47	4.38
67	3B	3.26	<DL	<DL	7.52	<DL	8.89	4.36
67	3C	3.03	<DL	<DL	7.41	<DL	15.4	4.64
67	3D	4.2	<DL	<DL	10.5	<DL	18.8	4.23
67	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
67	3F	3.71	<DL	<DL	1.11	<DL	30.9	4.98
67	4A	2.96	<DL	<DL	5.33	0.684	1.12	4.12
67	4B	4.39	<DL	<DL	13.5	<DL	6.28	4.05
67	4C	4.85	<DL	<DL	12.5	<DL	14.1	4.44
67	4D	2.68	<DL	<DL	14	<DL	13.7	4.28
67	4E	4.02	<DL	<DL	1.62	<DL	42.5	4.68
67	4F	3.19	<DL	<DL	3.45	<DL	27	4.74
67	5A	14.1	0.114	<DL	7.78	<DL	2.89	6.01
67	5B	9.35	<DL	<DL	21.7	<DL	13.6	4.03
67	5C	3.02	<DL	<DL	20.2	<DL	19.1	4.52
67	5D	2.57	<DL	<DL	19.1	<DL	19.4	4.34
67	5E	4.36	<DL	<DL	3.53	<DL	35.1	4.66
67	5F	3.62	<DL	<DL	3.28	<DL	31.4	4.73
67	6A	5.36	<DL	<DL	6.13	<DL	16.3	4.7
67	6B	4.5	<DL	<DL	16.8	<DL	13	4.17
67	6C	3.19	<DL	<DL	16.6	<DL	22.8	4.43
67	6D	2.28	<DL	<DL	7.13	<DL	31	4.65
67	6E	3.73	<DL	<DL	0.599	<DL	44.2	4.76
67	6F	3.02	<DL	<DL	3.05	<DL	32.7	4.77
67	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.91
67	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.99
67	R3	1.59	<DL	<DL	<DL	<DL	0.428	5.15
70	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.08
70	1B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	3.93
70	1C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.62
70	1D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.35
70	1E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.81
70	1F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.82
70	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.28
70	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.04
70	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.58
70	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.42
70	2E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.77
70	2F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.65
70	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.42
70	3B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.41
70	3C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.57

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
70	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.32
70	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.63
70	3F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.05
70	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.22
70	4B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.11
70	4C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
70	4D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.32
70	4E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.75
70	4F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.8
70	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.32
70	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.13
70	5C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.6
70	5D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.38
70	5E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.64
70	5F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.79
70	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5
70	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.3
70	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.42
70	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.7
70	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.78
70	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.82
70	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.03
70	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.96
70	R4	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.06
74	1A	4.05	<DL	<DL	4.05	0.741	1.52	3.97
74	1B	2.99	<DL	<DL	12	<DL	7.59	3.94
74	1C	3.71	<DL	<DL	8.86	<DL	17.1	4.57
74	1D	2.74	<DL	<DL	13.4	<DL	10.8	4.28
74	1E	3.85	<DL	<DL	1.14	<DL	37.4	4.73
74	1F	2.94	<DL	<DL	0.969	<DL	35.9	4.72
74	2A	3.08	<DL	<DL	6.58	<DL	5.05	4.26
74	2B	3.42	<DL	<DL	15	<DL	12	4.02
74	2C	3.02	<DL	<DL	10.1	<DL	18.9	4.5
74	2D	5.44	<DL	<DL	17.6	<DL	12.9	4.46
74	2E	3.71	<DL	<DL	4.16	<DL	41.5	4.69
74	2F	3.28	<DL	<DL	1.48	<DL	44.6	4.55
74	3A	2.85	<DL	<DL	7.13	<DL	5.08	4.61
74	3B	3.25	<DL	<DL	7.38	<DL	10.6	4.44
74	3C	3.53	<DL	<DL	8.09	<DL	19	4.58
74	3D	7.72	<DL	<DL	10.5	<DL	17.8	4.5
74	3E	3.93	<DL	<DL	0.342	<DL	48.1	4.71
74	3F	3.45	<DL	<DL	3.02	<DL	30.6	5.01

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
74	4A	8.52	<DL	<DL	5.93	0.57	1.29	4.31
74	4B	4.25	<DL	<DL	11.4	<DL	6.79	4.13
74	4C	3.71	<DL	<DL	13.1	<DL	17.7	4.36
74	4D	2.94	<DL	<DL	14.5	<DL	14.2	4.25
74	4E	8.24	<DL	<DL	2.68	<DL	40.1	4.69
74	4F	2.94	<DL	<DL	5.67	<DL	23.2	4.74
74	5A	8.75	<DL	<DL	6.93	<DL	2.89	6
74	5B	9.32	<DL	<DL	18.8	<DL	13.2	4.08
74	5C	3.73	<DL	<DL	19.6	<DL	18.8	4.52
74	5D	2.71	<DL	<DL	19.6	<DL	18.5	4.34
74	5E	3.85	<DL	<DL	6.27	<DL	31.7	4.55
74	5F	3.14	<DL	<DL	4.7	<DL	29.2	4.7
74	6A	5.19	<DL	<DL	6.61	<DL	10.5	4.95
74	6B	4.25	<DL	<DL	13.9	<DL	12.5	4.27
74	6C	3.96	<DL	<DL	15.4	<DL	19.5	4.37
74	6D	6.33	<DL	<DL	6.98	<DL	26	4.72
74	6E	3.9	<DL	<DL	1.51	<DL	41.2	4.76
74	6F	2.88	<DL	<DL	4.59	<DL	30.4	4.77
74	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.44
74	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.55
74	R5	1.27	<DL	<DL	<DL	<DL	0.941	5.14
77	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.01
77	1B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.05
77	1C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.6
77	1D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.11
77	1E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.78
77	1F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.58
77	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.18
77	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.15
77	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
77	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.1
77	2E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.64
77	2F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.46
77	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.33
77	3B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
77	3C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.59
77	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.22
77	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.69
77	3F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.65
77	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.03
77	4B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.23
77	4C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.38

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
77	4D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.18
77	4E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.68
77	4F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
77	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.01
77	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.14
77	5C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.5
77	5D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.33
77	5E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
77	5F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.6
77	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.72
77	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.29
77	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.38
77	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.59
77	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.67
77	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.64
77	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.57
77	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.61
77	R6	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.09
82	1A	2.81	<DL	<DL	4.25	<DL	3.26	4.05
82	1B	2.76	<DL	<DL	14.8	<DL	9.36	3.93
82	1C	2.87	<DL	<DL	8.72	<DL	15.7	4.47
82	1D	3.13	<DL	<DL	13.3	<DL	9.39	4.08
82	1E	3.5	<DL	<DL	2.45	<DL	34.3	4.59
82	1F	2.56	<DL	<DL	1.88	<DL	32.6	4.61
82	2A	2.24	<DL	<DL	7.24	<DL	5.2	4.17
82	2B	3.21	<DL	<DL	17.7	<DL	12.5	3.97
82	2C	2.73	<DL	<DL	10.8	<DL	15.8	4.42
82	2D	4.52	<DL	<DL	18.2	<DL	11.8	4.04
82	2E	2.9	<DL	<DL	6.87	<DL	35.3	4.46
82	2F	2.7	<DL	<DL	2.59	<DL	43.6	4.41
82	3A	2.76	<DL	<DL	7.38	<DL	5.42	4.29
82	3B	2.53	<DL	<DL	7.01	<DL	9.47	4.36
82	3C	2.87	<DL	<DL	7.52	<DL	16.9	4.48
82	3D	4.44	<DL	<DL	9.18	<DL	18	4.25
82	3E	3.44	<DL	<DL	0.713	<DL	46.3	4.53
82	3F	2.76	<DL	<DL	5.42	<DL	26.8	4.48
82	4A	2.5	<DL	<DL	4.3	<DL	1.12	4.14
82	4B	2.78	<DL	<DL	11.2	<DL	7.19	4.04
82	4C	3.04	<DL	<DL	11.3	<DL	14.2	4.26
82	4D	3.27	<DL	<DL	13.4	<DL	12.9	4.18
82	4E	2.84	<DL	<DL	3.65	<DL	35.2	4.58
82	4F	2.64	<DL	<DL	8.21	<DL	19.8	4.45

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
82	5A	31	0.428	<DL	7.84	<DL	8.93	5.98
82	5B	5.01	<DL	<DL	16.4	<DL	10.9	4.12
82	5C	2.78	<DL	<DL	19.3	<DL	17.3	4.43
82	5D	2.73	<DL	<DL	19.6	<DL	16.8	4.24
82	5E	2.93	<DL	<DL	7.7	<DL	28.3	4.43
82	5F	2.9	<DL	<DL	6.64	<DL	27.8	4.49
82	6A	2.98	<DL	<DL	6.53	<DL	21.8	4.5
82	6B	3.75	<DL	<DL	11.6	<DL	11.8	4.24
82	6C	2.78	<DL	<DL	13.1	<DL	17.3	4.34
82	6D	2.58	<DL	<DL	6.84	<DL	23.3	4.52
82	6E	2.87	<DL	<DL	2.62	<DL	38.1	4.58
82	6F	2.53	<DL	<DL	6.61	<DL	27.9	4.53
82	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.55
82	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.67
82	R1	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.15
84	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.03
84	1B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	3.91
84	1C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.46
84	1D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.33
84	1E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.61
84	1F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.73
84	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
84	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.09
84	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.42
84	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.17
84	2E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	447
84	2F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
84	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.53
84	3B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.44
84	3C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.55
84	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.4
84	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.6
84	3F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.57
84	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.1
84	4B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.17
84	4C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.32
84	4D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.29
84	4E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.61
84	4F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.46
84	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.99
84	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.12
84	5C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
84	5D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.29
84	5E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.44
84	5F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
84	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.82
84	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.3
84	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.37
84	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.5
84	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.59
84	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.55
84	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.86
84	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.93
84	R2	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.98
88	1A	6.4	<DL	<DL	5.04	0.618	1.46	4.09
88	1B	4.58	<DL	<DL	10.5	<DL	6.71	4.04
88	1C	4.09	<DL	<DL	9.83	<DL	13.3	4.44
88	1D	4.21	<DL	<DL	14.1	<DL	8.82	4.23
88	1E	4.24	<DL	<DL	4.45	<DL	29	4.57
88	1F	3.9	<DL	<DL	3.16	<DL	27.8	4.64
88	2A	3.92	<DL	<DL	7.24	<DL	4.66	4.36
88	2B	6.03	<DL	<DL	10.6	<DL	8.96	4.17
88	2C	3.67	<DL	<DL	10.3	<DL	15.5	4.47
88	2D	3.8	<DL	<DL	19.6	<DL	10.5	n.d.
88	2E	4.21	<DL	<DL	8.95	<DL	32.5	4.44
88	2F	3.07	<DL	<DL	3.25	<DL	41.4	4.45
88	3A	5.52	<DL	<DL	7.87	<DL	5.11	4.64
88	3B	5.49	<DL	<DL	6.75	<DL	9.07	4.48
88	3C	4.47	<DL	<DL	7.07	<DL	15.3	4.58
88	3D	3.69	<DL	<DL	13.8	<DL	16.5	n.d.
88	3E	3.92	<DL	<DL	1.08	<DL	44.2	4.62
88	3F	3.41	<DL	<DL	7.35	<DL	23.5	4.55
88	4A	7.03	<DL	<DL	7.27	<DL	4.69	4.11
88	4B	8.37	<DL	<DL	8.64	<DL	8.26	4.18
88	4C	3.78	<DL	<DL	9.35	<DL	15.4	4.32
88	4D	2.93	<DL	<DL	12.5	<DL	14	4.28
88	4E	4.95	<DL	<DL	4.85	<DL	33.3	4.57
88	4F	2.84	<DL	<DL	10.1	<DL	19.1	4.41
88	5A	37.6	<DL	<DL	8.95	<DL	4.01	6.04
88	5B	16.2	<DL	<DL	13.7	<DL	11.3	4.21
88	5C	4.69	<DL	<DL	16.7	<DL	18.1	4.46
88	5D	3.24	<DL	<DL	17	<DL	17	4.38
88	5E	4.47	<DL	<DL	8.27	<DL	27.6	4.45
88	5F	3.18	<DL	<DL	8.38	<DL	27.5	4.48

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
88	6A	3.98	<DL	<DL	6.56	<DL	8.46	4.98
88	6B	3.75	<DL	<DL	10.3	<DL	11.3	4.38
88	6C	4.27	<DL	<DL	11.1	<DL	16.5	4.43
88	6D	3.33	<DL	<DL	6.98	<DL	22	4.58
88	6E	4.98	<DL	<DL	2.76	<DL	38.5	4.58
88	6F	2.95	<DL	<DL	8.44	<DL	27.3	4.51
88	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.75
88	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.82
88	R3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.02
91	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	3.81
91	1B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	3.96
91	1C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.33
91	1D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.22
91	1E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
91	1F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
91	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.23
91	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.14
91	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.37
91	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.17
91	2E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.38
91	2F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.38
91	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
91	3B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.4
91	3C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.54
91	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.59
91	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.55
91	3F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.42
91	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.04
91	4B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.06
91	4C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.24
91	4D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.48
91	4E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.48
91	4F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.25
91	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.87
91	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.11
91	5C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.4
91	5D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.34
91	5E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.35
91	5F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.39
91	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.9
91	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.25
91	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.35

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
91	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.51
91	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.48
91	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.36
91	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.9
91	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.92
91	R4	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.89
95	1A	17.3	<DL	<DL	11.5	0.713	3.67	3.75
95	1B	11.6	<DL	<DL	10.4	<DL	6.66	3.95
95	1C	8.54	<DL	<DL	9.95	<DL	13.4	4.44
95	1D	13.3	<DL	<DL	13.4	<DL	8.97	4.29
95	1E	7.69	<DL	<DL	6.78	<DL	27.4	4.51
95	1F	4.84	<DL	<DL	5.7	<DL	26.7	4.44
95	2A	8	<DL	<DL	8.18	<DL	5.63	4.25
95	2B	5.12	<DL	<DL	9.23	<DL	8.48	4.21
95	2C	11.8	<DL	<DL	10	<DL	15.3	4.45
95	2D	32.4	<DL	<DL	18.3	<DL	12	4.16
95	2E	8.2	<DL	<DL	10.3	<DL	30.7	4.45
95	2F	3.55	<DL	<DL	4.5	<DL	42.7	4.41
95	3A	5.12	<DL	<DL	7.04	<DL	5.18	4.62
95	3B	12.6	<DL	<DL	7.07	<DL	9.17	4.42
95	3C	6.49	<DL	<DL	7.41	<DL	14.9	4.6
95	3D	8.94	<DL	<DL	8.69	<DL	17	4.53
95	3E	4.58	<DL	<DL	1.28	<DL	42.5	4.6
95	3F	3.21	<DL	<DL	8.01	<DL	25.5	4.48
95	4A	77.7	<DL	<DL	7.47	<DL	2.58	3.94
95	4B	8	<DL	<DL	9.29	<DL	7.23	4.24
95	4C	11.2	<DL	<DL	8.72	<DL	14.2	4.39
95	4D	6.6	<DL	<DL	11.4	<DL	12.4	4.36
95	4E	14.6	<DL	<DL	5.9	<DL	30.1	4.6
95	4F	4.09	<DL	<DL	11.3	<DL	18.1	4.37
95	5A	26.3	<DL	<DL	7.35	<DL	3.5	5.82
95	5B	14.7	<DL	<DL	12	<DL	10.7	4.17
95	5C	10.1	<DL	<DL	14.1	<DL	17.1	4.53
95	5D	3.7	<DL	<DL	14.1	<DL	14.9	4.43
95	5E	8.54	<DL	<DL	8.61	<DL	25	4.44
95	5F	3.44	<DL	<DL	9.38	<DL	26.5	4.39
95	6A	9.94	<DL	<DL	5.47	<DL	21.8	4.7
95	6B	4.52	<DL	<DL	11.5	<DL	11.5	4.28
95	6C	6.6	<DL	<DL	10.3	<DL	16.2	4.45
95	6D	5.61	<DL	<DL	6.13	<DL	20.8	4.54
95	6E	4.75	<DL	<DL	3.08	<DL	37	4.59
95	6F	3.41	<DL	<DL	9.72	<DL	26.7	4.38

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
95	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.28
95	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.47
95	R5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.95
98	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	3.83
98	1B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4
98	1C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.4
98	1D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.27
98	1E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.43
98	1F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.36
98	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.21
98	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.24
98	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.38
98	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.13
98	2E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.4
98	2F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.33
98	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.35
98	3B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.42
98	3C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.54
98	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
98	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.49
98	3F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.37
98	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	3.93
98	4B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.24
98	4C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.4
98	4D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.25
98	4E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.58
98	4F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.27
98	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.81
98	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.16
98	5C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
98	5D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.5
98	5E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.39
98	5F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.34
98	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.53
98	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.25
98	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
98	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
98	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
98	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.31
98	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.47
98	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.62
98	R6	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.83

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
103	1A	9.95	<DL	<DL	8.41	<DL	4.09	3.84
103	1B	8.52	<DL	<DL	9.32	<DL	6.22	4.01
103	1C	8.15	<DL	<DL	9.09	<DL	12.2	4.42
103	1D	13.4	<DL	<DL	13	<DL	7.85	4.33
103	1E	9.83	<DL	<DL	8.98	<DL	22.7	4.42
103	1F	3.73	<DL	<DL	8.32	<DL	22.6	4.31
103	2A	3.51	<DL	<DL	7.64	<DL	6.02	4.22
103	2B	5.19	<DL	<DL	8.32	<DL	7.88	4.28
103	2C	4.93	<DL	<DL	9.06	<DL	13.9	4.45
103	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
103	2E	5.36	<DL	<DL	10.9	<DL	27.5	4.43
103	2F	3.36	<DL	<DL	5.79	<DL	39.8	4.34
103	3A	6.95	<DL	<DL	6.01	<DL	5.37	4.45
103	3B	5.93	<DL	<DL	7.7	<DL	9.04	4.44
103	3C	6.44	<DL	<DL	8.35	<DL	14.5	4.57
103	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
103	3E	7.35	<DL	<DL	1.82	<DL	41.1	4.57
103	3F	3.22	<DL	<DL	9.63	<DL	24.3	4.42
103	4A	14.9	<DL	<DL	8.41	<DL	2	4.05
103	4B	5.3	<DL	<DL	9.18	<DL	7.13	4.19
103	4C	4.5	<DL	<DL	7.89	<DL	14.2	4.36
103	4D	4.67	<DL	<DL	10.4	<DL	11.4	4.23
103	4E	5.47	<DL	<DL	6.78	<DL	26.8	4.5
103	4F	3.16	<DL	<DL	11.2	<DL	18.6	4.26
103	5A	15.6	<DL	<DL	6.18	<DL	3.23	5.65
103	5B	9.38	<DL	<DL	10.3	<DL	10.9	4.45
103	5C	5.73	<DL	<DL	11.3	<DL	17.7	4.52
103	5D	3.51	<DL	<DL	12.3	<DL	15.8	4.4
103	5E	5.16	<DL	<DL	8.55	<DL	23.8	4.44
103	5F	3.02	<DL	<DL	10.1	<DL	25.6	4.34
103	6A	4.33	<DL	<DL	4.7	<DL	18	4.5
103	6B	6.36	<DL	<DL	10.9	<DL	12.2	4.23
103	6C	3.82	<DL	<DL	10.4	<DL	16.4	4.43
103	6D	4.16	<DL	<DL	6.36	<DL	20	4.46
103	6E	4.28	<DL	<DL	3.42	<DL	35.9	4.5
103	6F	2.88	<DL	<DL	10.3	<DL	26.2	4.23
103	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.87
103	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.04
103	R1	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.09
105	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	3.9
105	1B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4
105	1C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.33

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
105	1D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.21
105	1E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.34
105	1F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.24
105	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.24
105	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.25
105	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.34
105	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.21
105	2E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.39
105	2F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.32
105	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.64
105	3B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.46
105	3C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.54
105	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.44
105	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.53
105	3F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.35
105	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	3.85
105	4B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.15
105	4C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.36
105	4D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.26
105	4E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.54
105	4F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.28
105	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.51
105	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.35
105	5C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.51
105	5D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.42
105	5E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.42
105	5F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.37
105	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.6
105	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.21
105	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.41
105	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.42
105	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.46
105	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.29
105	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.12
105	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.25
105	R2	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.98
109	1A	20.6	<DL	<DL	6.01	<DL	2.2	3.94
109	1B	8.84	<DL	<DL	8.01	<DL	5.74	3.97
109	1C	11.2	<DL	<DL	8.49	<DL	12	4.43
109	1D	8.86	<DL	<DL	12.5	<DL	8.22	4.4
109	1E	7.89	<DL	<DL	10.1	<DL	22.2	4.39
109	1F	4.19	<DL	<DL	8.55	<DL	24.6	4.27

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
109	2A	4.99	<DL	<DL	6.47	<DL	5.34	4.34
109	2B	6.04	<DL	<DL	7.58	<DL	7.65	4.3
109	2C	13.7	<DL	<DL	7.92	<DL	13.2	4.46
109	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
109	2E	6.13	<DL	<DL	11.2	<DL	26.4	4.42
109	2F	3.36	<DL	<DL	6.27	<DL	40.8	4.35
109	3A	5.24	<DL	<DL	4.28	<DL	3.77	4.74
109	3B	5.84	<DL	<DL	7.38	<DL	8.87	4.47
109	3C	8.12	<DL	<DL	9.32	<DL	14.1	4.6
109	3D	11.1	<DL	<DL	9.09	<DL	16.1	4.64
109	3E	4.5	<DL	<DL	1.88	<DL	36.4	4.57
109	3F	3.56	<DL	<DL	10.4	<DL	25.3	4.4
109	4A	3.93	<DL	<DL	5.93	<DL	2.81	4.03
109	4B	5.87	<DL	<DL	8.44	<DL	7.54	4.2
109	4C	4.3	<DL	<DL	7.84	<DL	12.9	4.4
109	4D	3.62	<DL	<DL	10.8	<DL	11.4	4.35
109	4E	3.96	<DL	<DL	7.38	<DL	23.8	4.56
109	4F	3.56	<DL	<DL	11.1	<DL	18.1	4.39
109	5A	17.1	<DL	<DL	6.38	<DL	3.41	5.87
109	5B	5.27	<DL	<DL	8.92	<DL	9.65	4.23
109	5C	3.76	<DL	<DL	9.89	<DL	17.2	4.55
109	5D	3.62	<DL	<DL	11.5	<DL	14.2	4.46
109	5E	5.67	<DL	<DL	8.41	<DL	23.3	4.44
109	5F	3.36	<DL	<DL	9.38	<DL	25.8	4.33
109	6A	7.55	<DL	<DL	3.33	<DL	8.77	4.97
109	6B	5.16	<DL	<DL	9.92	<DL	11.2	4.26
109	6C	3.45	<DL	<DL	10.1	<DL	15.4	4.43
109	6D	3.33	<DL	<DL	6.95	<DL	17.2	4.43
109	6E	8.64	<DL	<DL	3.48	<DL	36.7	4.49
109	6F	3.22	<DL	<DL	10.2	<DL	25.7	4.27
109	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.32
109	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.52
109	R3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.94
112	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.06
112	1B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.06
112	1C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.37
112	1D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.32
112	1E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.36
112	1F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.36
112	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.55
112	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.16
112	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.43

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
112	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.4
112	2E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.38
112	2F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.32
112	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.68
112	3B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.47
112	3C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.54
112	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
112	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.53
112	3F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.35
112	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.04
112	4B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.19
112	4C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.39
112	4D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.36
112	4E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.5
112	4F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.38
112	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.89
112	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.26
112	5C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.57
112	5D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.49
112	5E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.48
112	5F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.32
112	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.58
112	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.27
112	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.43
112	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
112	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.48
112	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.32
112	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.46
112	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.74
112	R4	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.2
116	1A	12.9	<DL	<DL	9.35	<DL	3.54	4.06
116	1B	7.6	<DL	<DL	10.5	<DL	6.76	4
116	1C	10.9	<DL	<DL	10.5	<DL	12.8	4.4
116	1D	6.29	<DL	<DL	14.3	<DL	10.1	4.42
116	1E	4.15	<DL	<DL	13.4	<DL	22.5	4.42
116	1F	3.35	<DL	<DL	12.2	<DL	29.3	4.3
116	2A	5.38	<DL	<DL	6.93	<DL	4.85	4.45
116	2B	6.66	<DL	<DL	11.7	<DL	8.05	4.27
116	2C	5.26	<DL	<DL	11.7	<DL	15	4.41
116	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
116	2E	4.95	<DL	<DL	14.1	<DL	28.2	4.37
116	2F	3.07	<DL	<DL	9.55	<DL	46	4.37

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
116	3A	5.55	<DL	<DL	5.76	<DL	3.97	4.95
116	3B	7.63	<DL	<DL	10.1	<DL	10.4	4.5
116	3C	6.4	<DL	<DL	12.6	<DL	15.9	4.51
116	3D	3.47	<DL	<DL	12.4	<DL	19.8	n.d.
116	3E	7.8	<DL	<DL	4.79	<DL	39	4.5
116	3F	3.72	<DL	<DL	14.3	<DL	31.2	4.33
116	4A	3.67	<DL	<DL	3.76	<DL	1.46	4.14
116	4B	6.37	<DL	<DL	12.5	<DL	8.87	4.14
116	4C	7.12	<DL	<DL	16.2	<DL	15.8	4.37
116	4D	6.63	<DL	<DL	12.8	<DL	15.3	4.35
116	4E	8.08	<DL	<DL	10.3	<DL	27.7	4.67
116	4F	3.18	<DL	<DL	13.1	<DL	23.5	4.41
116	5A	27.1	<DL	<DL	8.52	<DL	4	5.82
116	5B	10.5	<DL	<DL	11.1	<DL	11.7	4.4
116	5C	4.12	<DL	<DL	11	<DL	21.2	4.69
116	5D	3.38	<DL	<DL	12.9	<DL	17.9	4.51
116	5E	8.03	<DL	<DL	10.3	<DL	27.4	4.54
116	5F	3.04	<DL	<DL	11.1	<DL	32.4	4.33
116	6A	4.81	<DL	<DL	3.88	<DL	14.9	4.79
116	6B	10.5	<DL	<DL	11.4	<DL	14.2	4.31
116	6C	6.26	<DL	<DL	11.8	<DL	19.3	4.5
116	6D	3.58	<DL	<DL	9.43	<DL	22.6	4.58
116	6E	7	<DL	<DL	4.7	<DL	40	4.53
116	6F	3.01	<DL	<DL	12	<DL	31.8	4.28
116	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.31
116	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.5
116	R5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5
119	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.02
119	1B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.03
119	1C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.44
119	1D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.46
119	1E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.4
119	1F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.37
119	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.44
119	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.34
119	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.4
119	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
119	2E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.39
119	2F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.31
119	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.96
119	3B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.53
119	3C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.54

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
119	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.75
119	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.54
119	3F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.42
119	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.17
119	4B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.24
119	4C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.39
119	4D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.49
119	4E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.53
119	4F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.42
119	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.94
119	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.28
119	5C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.51
119	5D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.56
119	5E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.48
119	5F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
119	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.04
119	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.38
119	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.48
119	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.62
119	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.55
119	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.38
119	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.37
119	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.45
119	R6	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.07
123	1A	25.3	<DL	<DL	11.8	<DL	3.74	3.99
123	1B	12.7	<DL	<DL	11.3	<DL	6.94	3.97
123	1C	6.72	<DL	<DL	10.3	<DL	12.8	4.3
123	1D	5.12	<DL	<DL	14.4	<DL	10.8	4.27
123	1E	5.12	<DL	<DL	14.1	<DL	21.1	4.35
123	1F	4.12	<DL	<DL	13.6	<DL	29	4.14
123	2A	5.49	<DL	<DL	6.98	<DL	6.11	4.35
123	2B	7.12	<DL	<DL	14.9	<DL	10.6	4.13
123	2C	8.4	<DL	<DL	10.3	<DL	15	4.42
123	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
123	2E	7.8	<DL	<DL	14.5	<DL	26.9	4.34
123	2F	4.21	<DL	<DL	12.1	<DL	52.6	4.22
123	3A	7.26	<DL	<DL	6.67	<DL	6.25	4.52
123	3B	10.9	<DL	<DL	10.3	<DL	9.93	4.39
123	3C	11.5	<DL	<DL	13.1	<DL	14.2	4.48
123	3D	11.8	<DL	<DL	12.1	<DL	17.9	4.39
123	3E	7.94	<DL	<DL	7.24	<DL	33.9	4.41
123	3F	3.7	<DL	<DL	15.7	<DL	30	4.25

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
123	4A	14.8	<DL	<DL	3.9	<DL	1.88	4.07
123	4B	7.2	<DL	<DL	11.2	<DL	9.15	4.16
123	4C	5.15	<DL	<DL	11.7	<DL	14.6	4.34
123	4D	4.44	<DL	<DL	13.5	<DL	14.8	4.28
123	4E	5.63	<DL	<DL	11.1	<DL	25.8	4.44
123	4F	4.29	<DL	<DL	13.6	<DL	22.3	4.34
123	5A	25.3	<DL	<DL	6.21	<DL	3.25	5.37
123	5B	22.3	<DL	<DL	10.7	<DL	11.5	4.19
123	5C	6.46	<DL	<DL	11.3	<DL	20.1	4.48
123	5D	5.61	<DL	<DL	12.6	<DL	16.7	4.31
123	5E	6.57	<DL	<DL	9.78	<DL	25.5	4.45
123	5F	4.32	<DL	<DL	10.4	<DL	32.4	4.32
123	6A	8.8	<DL	<DL	2.88	<DL	10.3	4.7
123	6B	7.03	<DL	<DL	11.1	<DL	14	4.29
123	6C	10.5	<DL	<DL	11.2	<DL	18.8	4.44
123	6D	4.58	<DL	<DL	9.23	<DL	19.6	4.4
123	6E	7.09	<DL	<DL	4.82	<DL	38.7	4.44
123	6F	4.15	<DL	<DL	10.9	<DL	31.8	4.32
123	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.14
123	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.3
123	R1	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.04
126	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.09
126	1B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.1
126	1C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
126	1D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.41
126	1E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.36
126	1F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.26
126	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.44
126	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.26
126	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.49
126	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.43
126	2E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.4
126	2F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.3
126	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.86
126	3B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.46
126	3C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.5
126	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.58
126	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.44
126	3F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.3
126	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.31
126	4B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.18
126	4C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.29

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
126	4D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.37
126	4E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.5
126	4F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.36
126	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.93
126	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.39
126	5C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.62
126	5D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.59
126	5E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
126	5F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.43
126	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.97
126	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.3
126	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
126	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.56
126	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.48
126	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.38
126	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.33
126	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	7.38
126	R2	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.94
130	1A	37.8	<DL	<DL	12	0.656	3.08	4.11
130	1B	5.8	<DL	<DL	12.1	<DL	7.15	4.02
130	1C	11.2	<DL	<DL	10.6	<DL	12.2	4.37
130	1D	4.78	<DL	<DL	15.4	<DL	11.7	4.3
130	1E	5.63	<DL	<DL	14.6	<DL	20.7	4.33
130	1F	4.04	<DL	<DL	14.8	<DL	31.8	4.2
130	2A	6.06	<DL	<DL	11.7	<DL	7.32	4.28
130	2B	10.7	<DL	<DL	17.2	<DL	12.9	4.04
130	2C	5.75	<DL	<DL	11.6	<DL	14.1	4.35
130	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
130	2E	6.12	<DL	<DL	15	<DL	27.4	4.34
130	2F	3.78	<DL	<DL	10.9	<DL	43.8	4.23
130	3A	6.32	<DL	<DL	6.56	<DL	4.9	4.65
130	3B	7.8	<DL	<DL	10.1	<DL	9.69	4.47
130	3C	7.46	<DL	<DL	13.4	<DL	14.4	4.489
130	3D	22.7	<DL	<DL	12.8	<DL	19.1	4.56
130	3E	8.46	<DL	<DL	9.78	<DL	32.5	4.41
130	3F	3.64	<DL	<DL	16.1	<DL	32.3	4.25
130	4A	5.35	<DL	<DL	4.39	<DL	1.48	4.06
130	4B	6.94	<DL	<DL	10.7	<DL	9.29	4.15
130	4C	8.14	<DL	<DL	11.5	<DL	14.7	4.32
130	4D	4.81	<DL	<DL	12.7	<DL	15.2	4.33
130	4E	7.43	<DL	<DL	11.6	<DL	25.2	4.46
130	4F	2.81	<DL	<DL	9.66	<DL	18.8	4.36

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
130	5A	10.9	<DL	<DL	16.7	<DL	17.8	5.82
130	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.33
130	5C	10.5	<DL	<DL	10.9	<DL	19.7	4.58
130	5D	6	<DL	<DL	12.1	<DL	18.9	4.5
130	5E	8.97	<DL	<DL	9.35	<DL	26.6	4.46
130	5F	3.92	<DL	<DL	10.1	<DL	35.9	4.34
130	6A	6.55	<DL	<DL	1.91	<DL	6.93	5.05
130	6B	9.71	<DL	<DL	10.3	<DL	13.9	4.31
130	6C	6.06	<DL	<DL	10.6	<DL	19.1	4.4
130	6D	4.81	<DL	<DL	8.89	<DL	19.5	4.58
130	6E	8.65	<DL	<DL	4.76	<DL	37	4.45
130	6F	4.09	<DL	<DL	10	<DL	35.1	4.36
130	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.2
130	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.33
130	R3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.74
133	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.04
133	1B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4
133	1C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.39
133	1D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.31
133	1E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.35
133	1F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.21
133	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.42
133	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.12
133	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.42
133	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.37
133	2E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.39
133	2F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.27
133	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.85
133	3B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.44
133	3C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
133	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.55
133	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.36
133	3F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.26
133	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.11
133	4B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.14
133	4C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.33
133	4D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.33
133	4E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.47
133	4F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.33
133	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.72
133	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.3
133	5C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.54

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
133	5D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.49
133	5E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.47
133	5F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.34
133	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.03
133	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.34
133	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
133	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.55
133	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
133	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.4
133	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.18
133	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.39
133	R4	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.21
138	1A	18.9	<DL	<DL	14.1	<DL	4.58	4.07
138	1B	6.64	<DL	<DL	11.9	<DL	6.86	4.03
138	1C	4.5	<DL	<DL	11.7	<DL	11.2	4.27
138	1D	8.15	<DL	<DL	15.4	<DL	8.63	4.38
138	1E	5.47	<DL	<DL	14.9	<DL	17.4	4.31
138	1F	3.73	<DL	<DL	15.3	<DL	27.9	4.2
138	2A	7.41	<DL	<DL	9.92	<DL	5.43	4.46
138	2B	8.32	<DL	<DL	13.9	<DL	9.17	4.24
138	2C	6.47	<DL	<DL	13.4	<DL	12.8	4.4
138	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
138	2E	9.23	<DL	<DL	15.2	<DL	24.3	4.35
138	2F	3.68	<DL	<DL	11.7	<DL	40.5	4.26
138	3A	6.13	<DL	<DL	5.44	<DL	3.41	4.98
138	3B	5.84	<DL	<DL	11.8	<DL	8.94	4.47
138	3C	4.56	<DL	<DL	14.4	<DL	11.7	4.55
138	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
138	3E	4.08	<DL	<DL	13	<DL	26.4	4.31
138	3F	4.13	<DL	<DL	18.4	<DL	31.8	4.22
138	4A	9.55	<DL	<DL	4.9	<DL	1.5	4.11
138	4B	6.04	<DL	<DL	10.5	<DL	9.05	4.15
138	4C	5.22	<DL	<DL	11.1	<DL	13.4	4.33
138	4D	6.53	<DL	<DL	11.6	<DL	13.2	4.46
138	4E	4.87	<DL	<DL	11.8	<DL	21.6	4.43
138	4F	3.76	<DL	<DL	14	<DL	22.8	4.37
138	5A	6.1	<DL	<DL	3.96	<DL	2.44	5.56
138	5B	5.96	<DL	<DL	9.43	<DL	10.8	4.29
138	5C	4.45	<DL	<DL	9.72	<DL	19.3	4.56
138	5D	4.1	<DL	<DL	11.8	<DL	15	4.39
138	5E	4.28	<DL	<DL	9.26	<DL	24.5	4.51
138	5F	3.36	<DL	<DL	10.1	<DL	32.1	4.39

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
138	6A	5.9	<DL	<DL	2.91	<DL	7.03	5.05
138	6B	4.65	<DL	<DL	12.2	<DL	13.7	4.33
138	6C	3.76	<DL	<DL	10.2	<DL	18.1	4.54
138	6D	3.76	<DL	<DL	8.84	<DL	16.1	4.48
138	6E	6.04	<DL	<DL	4.87	<DL	33.9	4.47
138	6F	3.71	<DL	<DL	9.29	<DL	31.6	4.28
138	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.75
138	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.77
138	R5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.25
140	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	3.9
140	1B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.02
140	1C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.4
140	1D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.34
140	1E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.37
140	1F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.23
140	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.32
140	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.27
140	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.47
140	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.31
140	2E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.39
140	2F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.25
140	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.71
140	3B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
140	3C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.54
140	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.46
140	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.31
140	3F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.2
140	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.07
140	4B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.17
140	4C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.32
140	4D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.31
140	4E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.41
140	4F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.27
140	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.69
140	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.36
140	5C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.55
140	5D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.49
140	5E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
140	5F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.37
140	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.87
140	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.29
140	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.47

Table 13: cont

Time (days)	Column # and port location	Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
		Element, Unit, Detection Limit						
140	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.53
140	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
140	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.36
140	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.8
140	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.72
140	R6	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.25
144	1A	5.02	<DL	<DL	16.4	<DL	3	n.d.
144	1B	10.3	<DL	<DL	11	<DL	5.55	4.01
144	1C	4.16	<DL	<DL	12	<DL	10.5	4.31
144	1D	3.9	<DL	<DL	15.4	<DL	10.1	4.23
144	1E	6.16	<DL	<DL	15	<DL	17.7	4.29
144	1F	3.62	<DL	<DL	15.8	<DL	30.1	4.19
144	2A	5.44	<DL	<DL	9.18	<DL	5.95	4.45
144	2B	5.47	<DL	<DL	11.8	<DL	8.03	4.39
144	2C	5.33	<DL	<DL	11.8	<DL	12.3	4.41
144	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
144	2E	6.41	<DL	<DL	15.6	<DL	21.2	4.33
144	2F	3.53	<DL	<DL	11.8	<DL	39.1	4.2
144	3A	7.32	<DL	<DL	6.13	<DL	3.5	5.03
144	3B	6.18	<DL	<DL	10.3	<DL	8.77	4.5
144	3C	5.3	<DL	<DL	13.7	<DL	11.4	4.51
144	3D	6.81	<DL	<DL	11.8	<DL	13.8	4.62
144	3E	5.93	<DL	<DL	15.3	<DL	26.7	4.28
144	3F	3.9	<DL	<DL	18.6	<DL	32.5	4.2
144	4A	7.17	<DL	<DL	5.81	<DL	2.3	4.17
144	4B	4.86	<DL	<DL	9.03	<DL	9.62	4.16
144	4C	5.41	<DL	<DL	10.8	<DL	12.3	4.33
144	4D	4.64	<DL	<DL	11.1	<DL	12.4	4.35
144	4E	5.23	<DL	<DL	12	<DL	19.8	4.42
144	4F	3.67	<DL	<DL	14.2	<DL	22.2	4.39
144	5A	10.1	<DL	<DL	3.19	<DL	1.9	5.93
144	5B	8.54	<DL	<DL	6.5	<DL	8.97	4.46
144	5C	4.24	<DL	<DL	9.01	<DL	18.5	4.6
144	5D	3.55	<DL	<DL	11.5	<DL	15.4	4.57
144	5E	4.64	<DL	<DL	9.35	<DL	24.2	4.52
144	5F	3.38	<DL	<DL	10.3	<DL	32.1	4.36
144	6A	3.87	<DL	<DL	1.45	<DL	6	5.1
144	6B	4.41	<DL	<DL	11.3	<DL	13.8	4.32
144	6C	5.09	<DL	<DL	11	<DL	17.9	4.45
144	6D	3.41	<DL	<DL	9.01	<DL	15.4	4.65
144	6E	3.41	<DL	<DL	4.59	<DL	33.3	4.49
144	6F	3.41	<DL	<DL	8.15	<DL	32.9	4.38

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
144	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.3
144	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.31
144	R1	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.24
147	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
147	1B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.15
147	1C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.41
147	1D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
147	1E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.44
147	1F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.3
147	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.59
147	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.39
147	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.48
147	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.68
147	2E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.45
147	2F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.31
147	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.21
147	3B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.69
147	3C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.63
147	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.84
147	3E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.35
147	3F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.38
147	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.1
147	4B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.17
147	4C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.35
147	4D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.63
147	4E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.49
147	4F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
147	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.6
147	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.46
147	5C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.6
147	5D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.73
147	5E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.55
147	5F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.54
147	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.28
147	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.69
147	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
147	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.8
147	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
147	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.59
147	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.42
147	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.44
147	R2	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.14

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit						
		Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
151	1A	21.9	<DL	<DL	17.6	<DL	5.21	4.04
151	1B	6.66	<DL	<DL	14.3	<DL	7.86	4.01
151	1C	4.86	<DL	<DL	12.6	<DL	10.6	4.3
151	1D	4.21	<DL	<DL	15.4	<DL	11.1	4.4
151	1E	9.37	<DL	<DL	15.5	<DL	17.9	4.3
151	1F	4.27	<DL	<DL	16.7	<DL	31.1	4.21
151	2A	5.49	<DL	<DL	7.81	<DL	5.38	4.6
151	2B	9.71	<DL	<DL	10.1	<DL	7.51	4.37
151	2C	9	<DL	<DL	10.8	<DL	12.6	4.48
151	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
151	2E	12.4	<DL	<DL	16.1	<DL	22.8	4.34
151	2F	5.43	<DL	<DL	12.6	<DL	37.4	4.3
151	3A	13.8	<DL	<DL	8.55	<DL	4.47	5.08
151	3B	10.7	<DL	<DL	10.2	<DL	8.28	4.52
151	3C	6.69	<DL	<DL	12.3	<DL	11	4.61
151	3D	8.43	<DL	<DL	13.2	<DL	15.4	4.69
151	3E	7.29	<DL	<DL	17	<DL	26.4	4.34
151	3F	4.44	<DL	<DL	18.8	<DL	34.6	4.27
151	4A	7.94	<DL	<DL	2.57	<DL	1.05	4.42
151	4B	7.12	<DL	<DL	6.38	<DL	8.91	4.22
151	4C	5.29	<DL	<DL	10.1	<DL	13.3	4.37
151	4D	5.21	<DL	<DL	10.3	<DL	13	4.48
151	4E	7.43	<DL	<DL	12.1	<DL	20.3	4.49
151	4F	3.9	<DL	<DL	14.6	<DL	24.1	4.39
151	5A	12.8	<DL	<DL	3.85	<DL	2.07	5.69
151	5B	14.2	<DL	<DL	5.67	<DL	8.4	4.42
151	5C	8.14	<DL	<DL	7.64	<DL	18.4	4.62
151	5D	4.12	<DL	<DL	10.7	<DL	16.3	4.63
151	5E	6.18	<DL	<DL	9.29	<DL	23.9	4.54
151	5F	3.58	<DL	<DL	10.6	<DL	31.9	4.43
151	6A	5.29	<DL	<DL	1.14	<DL	6.23	5.14
151	6B	7.12	<DL	<DL	9.8	<DL	13.2	4.41
151	6C	6.12	<DL	<DL	10.5	<DL	18	4.55
151	6D	3.72	<DL	<DL	8.75	<DL	15.4	4.69
151	6E	6.09	<DL	<DL	4.45	<DL	32.4	4.54
151	6F	3.7	<DL	<DL	7.75	<DL	33.2	4.47
151	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.06
151	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.04
151	R3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.89
154	1A	50	<DL	<DL	11.4	<DL	4.09	4.01
154	1B	13.1	<DL	<DL	13.1	<DL	6.89	4.08
154	1C	6.5	<DL	<DL	13.3	<DL	9.65	4.34

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
154	1D	5.1	<DL	<DL	15.4	<DL	10.8	4.45
154	1E	5.7	<DL	<DL	15.4	<DL	16.6	4.36
154	1F	3.71	<DL	<DL	16.8	<DL	28.8	4.35
154	2A	7.89	<DL	<DL	11.1	<DL	7.43	4.53
154	2B	9.38	<DL	<DL	11.1	<DL	6.72	4.41
154	2C	10.3	<DL	<DL	10.6	<DL	12.9	4.5
154	2D	23.9	<DL	<DL	16.7	<DL	12.2	4.52
154	2E	10.4	<DL	<DL	16.2	<DL	20.1	4.44
154	2F	4.1	<DL	<DL	12.8	<DL	39.6	4.32
154	3A	7.7	<DL	<DL	7.76	<DL	5.52	4.84
154	3B	6.36	<DL	<DL	9.92	<DL	8.4	4.54
154	3C	5.36	<DL	<DL	12.1	<DL	10.7	4.65
154	3D	8.81	<DL	<DL	12.8	<DL	16.8	4.76
154	3E	5.44	<DL	<DL	17.6	<DL	26.5	4.36
154	3F	3.85	<DL	<DL	18.7	<DL	34.3	4.36
154	4A	6.73	<DL	<DL	2.96	<DL	1.22	4.26
154	4B	5.56	<DL	<DL	8.41	<DL	9.28	4.28
154	4C	9.63	<DL	<DL	10.1	<DL	13.2	4.42
154	4D	5.02	<DL	<DL	10	<DL	14.7	4.5
154	4E	10.2	<DL	<DL	12.1	<DL	18.9	4.51
154	4F	3.85	<DL	<DL	14.7	<DL	25.8	4.54
154	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.78
154	5B	11.8	<DL	<DL	4.9	<DL	9.31	4.53
154	5C	9.21	<DL	<DL	7.13	<DL	20.8	4.75
154	5D	4.45	<DL	<DL	10.2	<DL	18.6	4.75
154	5E	8.32	<DL	<DL	9.23	<DL	27.1	4.66
154	5F	3.68	<DL	<DL	10.6	<DL	32.9	4.48
154	6A	11.5	<DL	<DL	1.03	<DL	6.83	5.16
154	6B	6.38	<DL	<DL	8.81	<DL	13	4.48
154	6C	9.18	<DL	<DL	10.2	<DL	17.5	4.56
154	6D	3.42	<DL	<DL	8.49	<DL	17.3	4.8
154	6E	7.81	<DL	<DL	4.28	<DL	32.4	4.58
154	6F	4.3	<DL	<DL	7.52	<DL	36	4.52
154	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.48
154	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.65
154	R4	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.03
172	1A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	1B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	1C	35	<DL	<DL	15.2	<DL	12.6	4.52
172	1D	11	<DL	<DL	16.9	<DL	11.2	4.46
172	1E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	4.52
172	1F	4.58	<DL	<DL	16.7	<DL	33.8	4.39

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit Cl- mg/L 0.086	NO2- mg/L 0.029	Br- mg/L 0.086	NO3- mg/L 0.029	PO43- mg/L 0.57	SO42- mg/L 0.26	pH
172	2A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	2E	16.6	<DL	<DL	9.75	<DL	12.4	4.45
172	2F	4.05	<DL	<DL	13.7	<DL	45.6	4.42
172	3A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	3B	21.1	<DL	<DL	18.6	<DL	15.8	4.35
172	3C	6.9	<DL	<DL	16.8	<DL	8.46	4.65
172	3D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	3E	9.11	<DL	<DL	18	<DL	27.7	4.35
172	3F	4.19	<DL	<DL	18.4	0.96	31.7	4.43
172	4A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	4B	13.1	<DL	<DL	13.9	<DL	13.6	4.22
172	4C	7.07	<DL	<DL	10	<DL	14.3	4.45
172	4D	44.2	<DL	<DL	10.6	<DL	15.3	4.42
172	4E	12.9	<DL	<DL	12.6	<DL	16.3	4.51
172	4F	4.3	<DL	<DL	12.9	<DL	26.7	4.52
172	5A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	5B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	5C	18.9	<DL	<DL	7.24	<DL	19.3	4.63
172	5D	11.8	<DL	<DL	10.7	<DL	18.3	4.77
172	5E	9.49	<DL	<DL	10	<DL	23.2	4.71
172	5F	3.76	<DL	<DL	9.52	<DL	35.8	4.56
172	6A	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6B	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6C	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6D	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6E	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	6F	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
172	BCAL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.25
172	BDOL	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	6.3

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
0	1A	107	587	55.4	8
0	1B	117	572	24.8	10
0	1C	83.5	625	7.81	8.5
0	1D	87.6	602	12.9	51
0	1E	917	624	8.87	9.5
0	1F	108	625	12.5	106.5
0	2A	78.9	547	49.1	89.5
0	2B	120	554	32.4	9.5
0	2C	80.6	537	9.18	10
0	2D	115	580	n.d.	7.5
0	2E	72.7	568	7.46	9.8
0	2F	92.7	593	14.6	202
0	3A	95.2	547	51.3	74
0	3B	82.9	607	14.1	8.5
0	3C	72.6	585	7.59	10
0	3D	103	640	n.d.	7.5
0	3E	70.1	606	n.d.	4.5
0	3F	114	606	22.9	170
0	4A	42.5	556	20.8	42.5
0	4B	69.2	626	8.32	9.8
0	4C	65.9	586	7.44	10
0	4D	77.5	598	7.54	93
0	4E	79.5	584	9.34	9.5
0	4F	129	612	12.4	140
0	5A	30.7	552	17.3	55
0	5B	74.5	602	13.3	10
0	5C	65.9	590	6.51	10
0	5D	73.9	636	5.5	37.5
0	5E	67.6	658	9.66	10
0	5F	135	645	14.9	185
0	6A	53.6	573	24.5	63
0	6B	69.8	601	10.9	10.4
0	6C	63.6	640	7.31	10.5
0	6D	114	620	20.7	12
0	6E	84.7	613	8.87	10
0	6F	148	639	11.5	231
0	BCAL	32	648	n.d.	43
0	BDOL	24.5	650	n.d.	42
0	R1	12.5	585	1.27	45
4	1A	137	n.d.	n.d.	4

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
4	1B	113	589	29	10
4	1C	83.6	502	8.54	10.3
4	1D	89.6	533	11.3	30
4	1E	81	628	6.37	10.6
4	1F	105	605	15.5	180
4	2A	131	509	61.2	64
4	2B	187	545	30.1	10.3
4	2C	895.6	512	7.57	10.9
4	2D	82.6	525	12.2	53
4	2E	68.1	494	10	10.4
4	2F	93	565	12.3	144
4	3A	95.7	530	49.3	59
4	3B	96.7	585	15.6	10.6
4	3C	76.3	487	7.86	11.2
4	3D	80.4	548	9.58	19
4	3E	94.2	552	n.d.	8.4
4	3F	93.2	544	19.1	152.5
4	4A	66.1	531	22.8	31
4	4B	78	542	8.65	10.5
4	4C	72.4	509	6.31	11
4	4D	77.3	536	9.03	127
4	4E	82.8	500	10.8	11.1
4	4F	113	581	13.7	106
4	5A	238	540	38.5	12
4	5B	113	568	14.5	10
4	5C	78	499	7.04	11
4	5D	72.7	533	5.97	83
4	5E	70.7	517	6.84	10.2
4	5F	112	574	16.7	153.5
4	6A	103	477	30.7	65
4	6B	93.1	514	11.9	10.4
4	6C	69.7	509	6.11	10.4
4	6D	89.6	547	11.1	42
4	6E	81.5	520	10.4	10
4	6F	112	576	12.6	158.5
4	BCAL	140	453	n.d.	45
4	BDOL	101	464	n.d.	51
4	R3	9.9	n.d.	0.959	42.5
7	1A	69.2	544	n.d.	12.5
7	1B	108	525	30.8	10.1
7	1C	80.9	499	8.85	10

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
7	1D	76.8	576	7.07	41
7	1E	72.7	519	9.81	11
7	1F	89.7	590	7.78	200
7	2A	81.5	536	41.9	109
7	2B	175	552	30.1	10.5
7	2C	90.9	509	8.65	10.5
7	2D	86.7	544	9.89	183
7	2E	66.1	505	9.74	10.9
7	2F	90.6	576	13.2	28
7	3A	105	495	67.1	70
7	3B	120	555	15.5	11.1
7	3C	74.4	503	7.46	11
7	3D	81.1	587	10.9	15
7	3E	82.3	503	6.76	10.4
7	3F	81.5	574	11.2	184
7	4A	44.8	541	17.1	15
7	4B	81	543	9.32	10.3
7	4C	74.7	520	7.02	10.9
7	4D	75.5	550	4.17	276
7	4E	80.5	513	8.87	11
7	4F	95.4	598	8.72	88.5
7	5A	138	475	35.4	15
7	5B	114	535	17.7	10.3
7	5C	82.6	504	6.75	11
7	5D	75.8	565	2.06	79
7	5E	69.1	519	9.97	10.4
7	5F	94	567	10.6	141.5
7	6A	88.1	454	30	35
7	6B	104	522	14.5	10.5
7	6C	71.5	505	6.38	10
7	6D	90.9	543	5.03	90.5
7	6E	79.5	504	11.2	10.7
7	6F	96.8	582	10.4	135
7	BCAL	114	444	n.d.	52
7	BDOL	88.6	463	n.d.	50
7	R4	9.32	n.d.	0.176	38
11	1A	72	505	58.9	12.5
11	1B	130	490	33.4	10
11	1C	85.2	485	10.6	10.8
11	1D	99.2	554	11.6	36
11	1E	74.9	484	8.32	10.6
11	1F	96.2	575	15.1	196

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
11	2A	100	492	57.5	60
11	2B	150	521	39.7	9.6
11	2C	109	505	10.1	11
11	2D	116	564	17.6	15
11	2E	72.7	483	10.9	10.5
11	2F	86.3	567	11.8	156
11	3A	151	466	97.3	23
11	3B	135	545	18.1	10.5
11	3C	91.8	499	10	10.9
11	3D	103	553	14.5	9
11	3E	72.4	484	15.4	10.9
11	3F	96.2	551	17.8	204
11	4A	54.2	517	20.5	11
11	4B	91.4	524	9.23	10
11	4C	79.5	489	6.84	10.4
11	4D	97.7	575	8.79	50
11	4E	82.5	480	11.1	10.5
11	4F	104	585	13.4	132
11	5A	n.d.	n.d.	n.d.	5
11	5B	122	506	22.3	10
11	5C	90.6	478	7.48	11
11	5D	95.9	563	6.6	74.8
11	5E	74.2	485	8.4	10.45
11	5F	105	583	12.7	147
11	6A	85.5	481	43	31
11	6B	114	502	15.8	10
11	6C	71.8	482	6.86	10.5
11	6D	120	564	11.6	87
11	6E	81.8	485	11.6	10.8
11	6F	106	597	15	146
11	BCAL	117	452	n.d.	45
11	BDOL	80.3	467	n.d.	45
11	R5	11	n.d.	2.06	40
14	1A	75	505	41.9	14
14	1B	116	497	41	9.1
14	1C	87.8	500	11.1	10
14	1D	85.8	560	11.1	35
14	1E	71.9	463	8.17	10.9
14	1F	99.8	580	11.5	243
14	2A	112	515	70.4	29
14	2B	121	510	57.6	10
14	2C	109	515	11	10.9

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
14	2D	103	579	10.2	15
14	2E	71.6	466	8.95	10.6
14	2F	86.5	565	12.5	229
14	3A	161	479	83	11
14	3B	106	522	20.8	10.5
14	3C	100	492	9.14	11.1
14	3D	95.4	565	11.7	14
14	3E	77.2	475	9.26	11.5
14	3F	94.7	547	13.7	263.5
14	4A	43.6	517	17.4	10.25
14	4B	99.2	530	10.3	10.4
14	4C	78.6	480	6.95	10.5
14	4D	86.7	560	5.35	30
14	4E	79.5	472	9.97	10.4
14	4F	94.5	572	14.4	221.5
14	5A	102	442	29	20
14	5B	107	501	31.7	9.5
14	5C	91.5	483	7.77	10.6
14	5D	84.1	571	8.48	74
14	5E	76.1	484	8.4	10.3
14	5F	86.7	587	11.4	187
14	6A	58.1	473	33.5	22
14	6B	120	508	17.3	10.9
14	6C	80.8	482	7.06	10.4
14	6D	108	546	9.58	50
14	6E	79.5	479	10.1	10.7
14	6F	86.7	563	14.1	213
14	BCAL	101	472	n.d.	48
14	BDOL	72.9	400	n.d.	49
14	R6	9.65	n.d.	2.76	39
18	1A	58	533	28	34
18	1B	164	505	54	8.6
18	1C	101	515	9.91	10.8
18	1D	92.6	553	8.72	25
18	1E	72.6	498	9.26	11
18	1F	86	565	14	225
18	2A	145	504	94.5	12
18	2B	131	510	64.4	9.5
18	2C	118	536	12.2	11
18	2D	105	553	13.6	19
18	2E	79.4	505	9.19	11
18	2F	83.9	565	10.4	257

Table 13: cont

Time (days)	Column # and port location	Element, Unit, Detection Limit EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
18	3A	97.3	495	59.6	10
18	3B	99.7	539	23.3	9.9
18	3C	113	533	12.4	10.6
18	3D	n.d.	n.d.	n.d.	n.d.
18	3E	82.4	506	11.8	11.6
18	3F	88.6	523	15.4	247
18	4A	32.6	567	13.2	50
18	4B	117	533	10.5	10
18	4C	87.8	503	7.37	9.5
18	4D	87.1	580	8.25	18
18	4E	89.3	497	10	10.5
18	4F	98.4	585	11.5	190
18	5A	117	n.d.	n.d.	6
18	5B	104	477	37.6	9
18	5C	103	501	8.65	10.3
18	5D	99	540	6.6	101
18	5E	79.8	501	9.11	10.8
18	5F	93.1	565	13.5	174
18	6A	93.9	474	53	13
18	6B	136	498	20	10.1
18	6C	88.6	494	7.39	10.5
18	6D	129	564	14.4	55
18	6E	82.5	496	9.5	10
18	6F	95.2	589	11.4	208
18	BCAL	121	465	n.d.	45
18	BDOL	83.7	469	n.d.	44
18	R1	9.39	n.d.	1.04	42.5
21	1A	94.3	572.3	27.2	25
21	1B	171	548	61.4	8.9
21	1C	113	519	10.3	10
21	1D	88.2	544.5	12	9
21	1E	85.1	494.3	9.42	10.5
21	1F	89.9	567.7	13.6	274
21	2A	116	506.9	67.4	18
21	2B	142	536.4	91	9.9
21	2C	124	581.2	12.2	10.5
21	2D	126	n.d.	n.d.	4
21	2E	90	512.4	10.9	10.2
21	2F	89	534.2	11	283
21	3A	151	n.d.	n.d.	7
21	3B	92.2	522	23.2	10.1
21	3C	118	523	12.6	10.3

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
21	3D	96.7	n.d.	n.d.	6
21	3E	88.7	503.8	11.3	10.4
21	3F	86.9	550.1	16	265
21	4A	43.5	523.5	19	20
21	4B	122	525.7	13.7	9.7
21	4C	95.8	502.1	8.28	10.2
21	4D	90.8	578.5	7.78	36
21	4E	90.9	495.4	10.9	10.5
21	4F	89.1	567.4	11.2	244
21	5A	118	453.3	55.6	10
21	5B	123	473.5	44.2	9.5
21	5C	107	508.5	9.49	10.5
21	5D	104	554.1	6.76	31
21	5E	83.8	504.7	11.7	10.1
21	5F	77.3	556.6	13.9	231
21	6A	143	457.2	47.8	22.5
21	6B	99.2	492.2	27.4	10.6
21	6C	137	497.8	8.23	11
21	6D	87.4	546.9	15.9	99
21	6E	89.7	494.4	9.97	10.9
21	6F	88.8	560.1	11.1	220
21	BCAL	91.6	501.8	n.d.	50
21	BDOL	76.3	496	n.d.	47
21	R2	12.8	n.d.	2.45	46
25	1A	71.9	584.8	20.8	21
25	1B	179	514.2	56	10
25	1C	116	517.9	9.67	10
25	1D	103	580.6	9.89	21
25	1E	86.9	530	9.81	10.1
25	1F	88.6	590.5	13.8	256
25	2A	127	504.3	56.1	12.5
25	2B	153	546.7	79.1	9.8
25	2C	124	n.d.	n.d.	10
25	2D	n.d.	n.d.	n.d.	0.8
25	2E	94.2	521.2	10.2	10.2
25	2F	89.7	585.5	11.1	290
25	3A	102	508	47.8	15
25	3B	103	523.2	19.9	10
25	3C	120	524.6	10.3	9.7
25	3D	76.2	552.5	11.5	9
25	3E	96.2	523.4	13.4	9
25	3F	88.9	538	15.7	268

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
25	4A	49	584.7	15.3	17
25	4B	125	546	15	10.1
25	4C	105	520.2	7.66	10.5
25	4D	89.5	586.4	8.56	25
25	4E	95.5	529.3	10.8	10.5
25	4F	89.2	597.2	11.3	234
25	5A	111	507.7	52.1	16
25	5B	145	505	43.3	10.3
25	5C	109	531.4	8.7	10.6
25	5D	105	570.8	7.15	30
25	5E	85.1	537.3	9.81	10.4
25	5F	89.4	584.4	14	222
25	6A	97.7	501.3	50.1	10
25	6B	152	506.8	28.8	10.5
25	6C	104	528.9	8.92	10.7
25	6D	153	591.8	13.7	89
25	6E	86.6	534.4	10	10
25	6F	85.6	596.4	11.2	161
25	BCAL	73.4	505.3	n.d.	41
25	BDOL	54.1	489.3	n.d.	42.5
25	R3	11.6	n.d.	3.47	49
28	1A	62	623.4	17.7	16
28	1B	152	603.9	46.2	10.2
28	1C	108	543.2	8.92	10
28	1D	92.8	579.6	10.9	17.5
28	1E	75.4	555.2	8.01	10.4
28	1F	66.9	600.1	9.26	245
28	2A	68.7	541.4	40	29
28	2B	128	575	66.5	9.8
28	2C	110	621.1	8.48	10.1
28	2D	n.d.	n.d.	n.d.	0.5
28	2E	85.3	551.4	9.11	9.9
28	2F	71.1	593.7	12.4	266
28	3A	60.1	524.1	38.4	17
28	3B	102	553	15.9	10.1
28	3C	108	554.9	9.54	10.4
28	3D	70	573.1	11.7	10
28	3E	89.3	551.3	10.7	11.1
28	3F	70.4	547.4	10.7	249
28	4A	33.6	582.8	10.9	26
28	4B	112	555	15.2	9.6
28	4C	101	541.4	6.86	10

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
28	4D	79.3	587.7	3.94	30
28	4E	84.1	547	10.2	10.1
28	4F	71.1	581.3	11.9	231.5
28	5A	60.9	508.9	42.8	25
28	5B	134	526.3	39.4	9.5
28	5C	106	550.8	8.06	10.3
28	5D	88.6	579.6	9.58	37
28	5E	80.9	554.4	8.17	10
28	5F	78.5	583.3	9.19	227
28	6A	74.9	503	31	15
28	6B	158	565.5	26.7	10.6
28	6C	106	549	7.5	9.9
28	6D	124	598.7	10.3	45
28	6E	80.6	548.4	8.87	10.1
28	6F	75.8	597.6	11.7	238
28	BCAL	79.8	491.6	n.d.	52
28	BDOL	63.7	485.4	n.d.	50
28	R4	11.1	n.d.	3.55	47
32	1A	113	638.8	16.5	12.5
32	1B	173	610.5	34.6	10.1
32	1C	127	530.8	8.41	10.7
32	1D	111	587.3	9.34	15
32	1E	82.4	540.4	8.17	10.7
32	1F	79	607.8	9.19	268
32	2A	103	527.4	36.1	24
32	2B	144	594	55.1	9.5
32	2C	114	608.4	8.26	10.4
32	2D	n.d.	n.d.	n.d.	n.d.
32	2E	92.8	540.4	9.97	10.5
32	2F	84.8	565.5	12.8	279
32	3A	103	529.9	28.8	20
32	3B	134	551	12.3	10
32	3C	122	539	8.23	10.5
32	3D	96.9	583.1	14	12
32	3E	98.2	n.d.	n.d.	5.1
32	3F	80.8	587.2	10.4	260
32	4A	52.9	584.2	11	20
32	4B	125	551.9	13.1	10
32	4C	113	528.4	6.18	10.6
32	4D	108	607.6	5.97	46
32	4E	95.2	538.4	9.97	10.6
32	4F	81.9	612.1	11.4	257

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
32	5A	65	500.6	28.5	38
32	5B	162	519	34.2	10.3
32	5C	123	535.7	7.9	10.6
32	5D	118	598.9	9.26	63.5
32	5E	89.8	543.3	5.97	10.7
32	5F	88.6	605.1	11	203.5
32	6A	146	534.6	20.4	19
32	6B	245	562.1	19.6	10.6
32	6C	123	534.1	6.73	10
32	6D	154	597.4	13.7	75
32	6E	88.4	536.8	9.58	10.6
32	6F	86.5	583	13.3	204
32	BCAL	85.6	471.5	n.d.	50
32	BDOL	62.1	473.2	n.d.	47.5
32	R5	14.5	n.d.	2.29	42
35	1A	106	662.5	13.2	16
35	1B	193	652.7	28.6	10
35	1C	137	545.2	7.95	10.2
35	1D	119	613.5	8.95	29
35	1E	82.3	551.6	5.5	10.2
35	1F	79.8	599.3	11.2	257.5
35	2A	90.3	545.4	27.7	32.5
35	2B	150	604.8	46.3	9.8
35	2C	118	584.3	7.86	10.2
35	2D	n.d.	n.d.	n.d.	n.d.
35	2E	96.5	542.6	10.4	10
35	2F	91.3	582.2	14.4	271
35	3A	79.4	555.1	20.2	27
35	3B	136	562.8	12.2	10
35	3C	131	541.8	8.17	10.1
35	3D	87.1	n.d.	n.d.	7
35	3E	116	n.d.	n.d.	6.5
35	3F	80	542.9	12.6	261
35	4A	48.2	602.3	8.72	36
35	4B	130	576.9	12.4	9.4
35	4C	136	525.2	6.24	10.3
35	4D	123	586.9	5.5	81
35	4E	98.7	540.1	10.5	10
35	4F	84.9	583.2	10.9	174
35	5A	55.1	492.6	22.7	39
35	5B	179	531.7	29.5	10.1
35	5C	135	538.9	29.9	10.2

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
35	5D	125	565.4	8.95	45
35	5E	89.9	544.3	6.37	10.6
35	5F	85.3	572.9	11.2	229
35	6A	104	535.5	10.9	19
35	6B	236	591.8	18.6	10.5
35	6C	142	538.4	6.31	10
35	6D	141	615.7	11.5	35
35	6E	87.9	539	9.11	10.2
35	6F	84.7	575	12.9	246
35	BCAL	78.8	467.3	n.d.	50
35	BDOL	55.6	458.6	n.d.	49
35	R6	11.3	n.d.	n.d.	45
39	1A	122	637.2	13.6	12
39	1B	209	607.5	23.3	10
39	1C	153	519.2	8.03	9.6
39	1D	142	561.8	8.09	26
39	1E	87.8	537.2	6.29	10.6
39	1F	83.8	558.2	11.5	258
39	2A	133	634	24.9	17
39	2B	171	n.d.	n.d.	9.7
39	2C	124	622.4	7.26	10.6
39	2D	n.d.	n.d.	n.d.	n.d.
39	2E	102	561	10.9	10.5
39	2F	89.3	589.1	12.9	286
39	3A	147	628.8	16.6	19
39	3B	143	581.2	11.5	10.7
39	3C	137	553	7.22	10.5
39	3D	117	580.3	13.4	9.5
39	3E	103	564.3	11.1	6.6
39	3F	87.2	552.6	12.7	266.5
39	4A	66.7	635.7	9.58	15
39	4B	158	606.6	10.6	9.6
39	4C	137	532.3	6.09	10.5
39	4D	132	588.8	5.9	39
39	4E	101	559.2	12.3	10
39	4F	87.6	590.9	13.6	242
39	5A	48.5	509	15.3	42.5
39	5B	214	538.3	22.8	10.3
39	5C	140	525.9	7.61	10.2
39	5D	137	578.2	8.01	45
39	5E	92.2	546	7.23	10.1
39	5F	90.1	581.8	11.3	212

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
39	6A	165	532.3	15	10
39	6B	246	584.6	16.6	10.6
39	6C	175	564.9	6.11	10
39	6D	176	587.9	11.4	191
39	6E	90.8	541.1	9.66	10.5
39	6F	94.7	562.1	12.1	112
39	BCAL	86.2	479.8	n.d.	50
39	BDOL	60.6	479.7	n.d.	47
39	R1	10.5	n.d.	3.7	42
42	1A	119	n.d.	n.d.	2
42	1B	204	642.6	20.8	10.1
42	1C	160	523.6	7.57	10.2
42	1D	113	606.4	7.46	27.5
42	1E	87.2	561.4	6.29	10.5
42	1F	79.1	594.6	11	277
42	2A	93.3	611.3	n.d.	25
42	2B	176	632.2	30.3	9.5
42	2C	130	576.8	6.82	10.3
42	2D	125	n.d.	n.d.	5
42	2E	99.3	558.4	12.1	9.7
42	2F	88.8	589.1	13.4	276
42	3A	118	621.6	15.9	17.5
42	3B	125	580.2	11.4	10
42	3C	135	536.1	7.04	9.9
42	3D	92.4	571.6	9.19	7.5
42	3E	100	n.d.	n.d.	6.4
42	3F	79.8	533.8	14.1	295
42	4A	33.8	614.6	7.81	27
42	4B	154	606	9.51	9.7
42	4C	145	531.6	5.89	10.2
42	4D	133	579.2	5.5	47.5
42	4E	96.9	553.9	13	10
42	4F	77.2	574.6	11	220
42	5A	36.2	507.6	12.1	50
42	5B	231	565.5	19.1	10.3
42	5C	152	525.3	7.06	9.5
42	5D	129	585	7.07	30
42	5E	93.3	546.9	7.38	9.7
42	5F	86.4	574.8	11.5	218
42	6A	79.5	532.6	16.7	24
42	6B	285	605.7	14.4	10
42	6C	193	587.5	6.31	10.5

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
42	6D	145	602.9	9.81	36
42	6E	88.6	552.6	10.5	10
42	6F	84.2	575.7	10.8	242
42	BCAL	81.2	480.8	n.d.	51
42	BDOL	59.7	478.9	n.d.	51
42	R2	11.3	n.d.	2.45	50
47	1A	155	n.d.	n.d.	3
47	1B	229	n.d.	n.d.	10
47	1C	165	n.d.	n.d.	10.7
47	1D	141	n.d.	n.d.	15
47	1E	91.1	n.d.	n.d.	10.3
47	1F	88.2	n.d.	n.d.	200
47	2A	193	n.d.	n.d.	17.5
47	2B	223	n.d.	n.d.	9.5
47	2C	142	n.d.	n.d.	9.8
47	2D	n.d.	n.d.	n.d.	n.d.
47	2E	105	n.d.	n.d.	9.8
47	2F	99.2	n.d.	n.d.	197
47	3A	97.7	n.d.	n.d.	18
47	3B	149	n.d.	n.d.	10
47	3C	136	n.d.	n.d.	10
47	3D	119	n.d.	n.d.	5
47	3E	102	n.d.	n.d.	5.5
47	3F	91.7	n.d.	n.d.	190
47	4A	47	n.d.	n.d.	46
47	4B	170	n.d.	n.d.	9.5
47	4C	154	n.d.	n.d.	10.1
47	4D	153	n.d.	n.d.	50
47	4E	103	n.d.	n.d.	10.4
47	4F	87.2	n.d.	n.d.	136
47	5A	56.8	n.d.	n.d.	40
47	5B	306	n.d.	n.d.	10.3
47	5C	164	n.d.	n.d.	10.3
47	5D	156	n.d.	n.d.	24
47	5E	98.4	n.d.	n.d.	10.2
47	5F	87.6	n.d.	n.d.	181
47	6A	108	n.d.	n.d.	20
47	6B	311	n.d.	n.d.	10.4
47	6C	200	n.d.	n.d.	10
47	6D	157	n.d.	n.d.	30
47	6E	93.6	n.d.	n.d.	9.9
47	6F	92	n.d.	n.d.	178

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
47	BCAL	89.2	n.d.	n.d.	47.5
47	BDOL	59.7	n.d.	n.d.	44
47	R3	11.8	n.d.	n.d.	45
49	1A	85.9	734.6	11	13
49	1B	225	759.1	17	10.1
49	1C	187	633	7.79	10.3
49	1D	165	676.4	6.44	25
49	1E	103	582.9	8.32	10.4
49	1F	92.5	664.6	12.4	258
49	2A	133	680.9	15	26
49	2B	210	684.4	19.7	9.4
49	2C	167	609.7	6.62	10.5
49	2D	176	618.9	12.4	9.5
49	2E	122	537	12.2	10.5
49	2F	103	630.8	13.2	234
49	3A	83.1	606.8	17.8	17.5
49	3B	134	599.2	10.9	10
49	3C	152	614.2	7.42	10.5
49	3D	158	633.8	8.09	12.5
49	3E	112	n.d.	n.d.	5.8
49	3F	98	612.3	13.4	191
49	4A	36.7	644.7	7.92	25
49	4B	160	639.1	8.83	9.9
49	4C	174	579.2	5.94	10.3
49	4D	161	627.4	6.21	37.5
49	4E	122	571.7	13.7	10
49	4F	92.3	621.3	10.8	184
49	5A	69	534.2	18.4	25
49	5B	339	602.6	14.9	10.4
49	5C	207	n.d.	n.d.	10.2
49	5D	179	630.1	5.74	37
49	5E	111	534.3	7.46	10.5
49	5F	94.2	612.6	11.8	213
49	6A	108	553.5	20.7	11
49	6B	287	626.9	13	10.6
49	6C	233	550.7	5.89	10.3
49	6D	180	632	9.03	32
49	6E	103	557.6	9.81	10.4
49	6F	94.2	618.5	10.4	218
49	BCAL	82.8	512	n.d.	54
49	BDOL	63.6	509.8	n.d.	54
49	R4	15.3	n.d.	1.82	47

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
53	1A	93	n.d.	n.d.	17
53	1B	188	n.d.	n.d.	10.1
53	1C	181	n.d.	n.d.	10
53	1D	156	n.d.	n.d.	15
53	1E	104	n.d.	n.d.	10.6
53	1F	100	n.d.	n.d.	164
53	2A	149	n.d.	n.d.	15
53	2B	237	n.d.	n.d.	9.8
53	2C	170	n.d.	n.d.	10.3
53	2D	146	n.d.	n.d.	5
53	2E	119	n.d.	n.d.	10.5
53	2F	107	n.d.	n.d.	170
53	3A	91.2	n.d.	n.d.	9
53	3B	131	n.d.	n.d.	10.4
53	3C	144	n.d.	n.d.	10.4
53	3D	126	n.d.	n.d.	8
53	3E	113	n.d.	n.d.	4
53	3F	102	n.d.	n.d.	159
53	4A	84.9	n.d.	n.d.	7.5
53	4B	173	n.d.	n.d.	9.7
53	4C	159	n.d.	n.d.	10.4
53	4D	159	n.d.	n.d.	42
53	4E	110	n.d.	n.d.	10.6
53	4F	94.7	n.d.	n.d.	128
53	5A	103	n.d.	n.d.	22.5
53	5B	370	n.d.	n.d.	10.3
53	5C	209	n.d.	n.d.	10.5
53	5D	164	n.d.	n.d.	30
53	5E	107	n.d.	n.d.	10.4
53	5F	92.5	n.d.	n.d.	153
53	6A	97.7	n.d.	n.d.	12.5
53	6B	256	n.d.	n.d.	10.5
53	6C	230	n.d.	n.d.	10.3
53	6D	189	n.d.	n.d.	25
53	6E	100	n.d.	n.d.	10.8
53	6F	96.8	n.d.	n.d.	182
53	BCAL	80.6	n.d.	n.d.	49
53	BDOL	50.9	n.d.	n.d.	49
53	R5	14.2	n.d.	n.d.	45
56	1A	95.1	632.3	15.3	19
56	1B	174	656.9	16.6	10.3
56	1C	165	530.1	7.31	10.6

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
56	1D	157	588.4	5.66	17.5
56	1E	101	523.5	6.44	10.6
56	1F	96.5	576.9	12.3	165
56	2A	126	623.1	15.4	18
56	2B	207	644.5	18.7	10.1
56	2C	161	615.2	6.38	10.8
56	2D	n.d.	n.d.	n.d.	n.d.
56	2E	119	523.9	11.5	10.4
56	2F	106	592.1	12.6	193
56	3A	101	n.d.	n.d.	5.5
56	3B	117	605.5	11	10.6
56	3C	135	521	6.86	10.5
56	3D	140	595	7.23	10
56	3E	n.d.	n.d.	n.d.	2.5
56	3F	100	562.2	13.2	195
56	4A	71.8	634.3	8.98	26
56	4B	151	616.1	8.48	10
56	4C	147	540.5	5.65	10.6
56	4D	158	607.7	4.8	63
56	4E	112	534.6	11.6	10.6
56	4F	95.2	586.3	9.5	116
56	5A	88.2	510.1	16.5	15
56	5B	376	606.7	12.6	10.3
56	5C	221	525.5	6.53	10.5
56	5D	202	613.6	5.11	32
56	5E	103	535.6	6.84	10.4
56	5F	99.3	575	10.9	188
56	6A	84.9	530.7	20.4	10
56	6B	226	606.9	12.7	10.6
56	6C	207	557.8	6.05	10
56	6D	157	603.7	9.11	17
56	6E	100	528.6	10.7	10.5
56	6F	98.1	584.1	10	200
56	BCAL	77.1	482.9	n.d.	51
56	BDOL	51.4	486.5	n.d.	50
56	R6	14.9	n.d.	n.d.	48
60	1A	106	n.d.	n.d.	5.5
60	1B	160	n.d.	n.d.	10
60	1C	153	n.d.	n.d.	10.3
60	1D	144	n.d.	n.d.	11
60	1E	103	n.d.	n.d.	10.5
60	1F	97.8	n.d.	n.d.	157

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
60	2A	124	n.d.	n.d.	19
60	2B	212	n.d.	n.d.	10
60	2C	154	n.d.	n.d.	10.5
60	2D	n.d.	n.d.	n.d.	1
60	2E	125	n.d.	n.d.	10.2
60	2F	110	n.d.	n.d.	151
60	3A	81.1	n.d.	n.d.	5.5
60	3B	122	n.d.	n.d.	10.4
60	3C	124	n.d.	n.d.	10.3
60	3D	115	n.d.	n.d.	7.5
60	3E	n.d.	n.d.	n.d.	2.2
60	3F	100	n.d.	n.d.	135
60	4A	93.1	n.d.	n.d.	8
60	4B	170	n.d.	n.d.	10
60	4C	159	n.d.	n.d.	10.4
60	4D	161	n.d.	n.d.	32
60	4E	118	n.d.	n.d.	10.5
60	4F	99.1	n.d.	n.d.	123
60	5A	140	n.d.	n.d.	13
60	5B	375	n.d.	n.d.	10.3
60	5C	242	n.d.	n.d.	10.2
60	5D	216	n.d.	n.d.	30
60	5E	110	n.d.	n.d.	10.4
60	5F	103	n.d.	n.d.	147
60	6A	104	n.d.	n.d.	7.5
60	6B	224	n.d.	n.d.	10.5
60	6C	215	n.d.	n.d.	10.5
60	6D	161	n.d.	n.d.	21
60	6E	107	n.d.	n.d.	10.5
60	6F	104	n.d.	n.d.	169
60	BCAL	74	n.d.	n.d.	49
60	BDOL	51.2	n.d.	n.d.	46
60	R1	14.5	n.d.	n.d.	50
63	1A	98.8	628.7	14.4	19
63	1B	163	723.6	16.5	10
63	1C	154	603.6	6.97	10.2
63	1D	159	686.7	5.19	30
63	1E	108	526.9	6.44	10.5
63	1F	102	654.7	12.2	141
63	2A	102	635.4	14.8	33
63	2B	226	608.4	18.4	10
63	2C	165	576.9	6.2	10.5

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
63	2D	182	616.9	15	15
63	2E	134	522.8	10.4	10.4
63	2F	116	641.9	12.1	153
63	3A	95.7	605.7	18.5	13.5
63	3B	118	598.2	10.4	10.1
63	3C	129	592.9	7.57	10.5
63	3D	129	640	5.97	11
63	3E	n.d.	n.d.	n.d.	n.d.
63	3F	104	n.d.	n.d.	185
63	4A	93.9	651.7	9.82	10
63	4B	172	637.8	8.39	9.5
63	4C	163	561.3	5.6	10
63	4D	154	640.8	5.27	22
63	4E	119	514.2	10.3	10.2
63	4F	104	613.8	9.34	133
63	5A	109	518.6	20.7	14.5
63	5B	318	614.4	13.3	10.4
63	5C	370	530.7	6.86	10.3
63	5D	235	623.6	4.56	37.5
63	5E	121	513.2	8.79	10.6
63	5F	106	606.9	10.5	162
63	6A	98.5	533.7	20.2	22.5
63	6B	214	611.3	12.4	10.6
63	6C	209	545	5.78	10.3
63	6D	155	610.1	7.23	42
63	6E	108	499.5	10.7	10.2
63	6F	110	598.2	9.42	147
63	BCAL	75.8	472.4	n.d.	51
63	BDOL	52.9	472.2	n.d.	47.5
63	R2	17.4	n.d.	2.29	50
67	1A	84.7	n.d.	n.d.	47.5
67	1B	177	n.d.	n.d.	10.2
67	1C	138	n.d.	n.d.	9.9
67	1D	155	n.d.	n.d.	34
67	1E	102	n.d.	n.d.	10.4
67	1F	105	n.d.	n.d.	96.5
67	2A	109	n.d.	n.d.	35
67	2B	215	n.d.	n.d.	9.9
67	2C	153	n.d.	n.d.	10.7
67	2D	204	n.d.	n.d.	9
67	2E	134	n.d.	n.d.	10.1
67	2F	118	n.d.	n.d.	129

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
67	3A	103	n.d.	n.d.	12.5
67	3B	112	n.d.	n.d.	10.1
67	3C	123	n.d.	n.d.	10.4
67	3D	146	n.d.	n.d.	9.5
67	3E	n.d.	n.d.	n.d.	n.d.
67	3F	108	n.d.	n.d.	143
67	4A	93.9	n.d.	n.d.	10
67	4B	165	n.d.	n.d.	9.4
67	4C	159	n.d.	n.d.	10.5
67	4D	166	n.d.	n.d.	25
67	4E	116	n.d.	n.d.	10
67	4F	109	n.d.	n.d.	137
67	5A	152	n.d.	n.d.	13
67	5B	385	n.d.	n.d.	10.5
67	5C	254	n.d.	n.d.	10
67	5D	245	n.d.	n.d.	47.5
67	5E	117	n.d.	n.d.	10
67	5F	113	n.d.	n.d.	141
67	6A	115	n.d.	n.d.	24.5
67	6B	202	n.d.	n.d.	10
67	6C	200	n.d.	n.d.	10.5
67	6D	146	n.d.	n.d.	38
67	6E	107	n.d.	n.d.	10.3
67	6F	114	n.d.	n.d.	135
67	BCAL	82.4	n.d.	n.d.	47.5
67	BDOL	55.8	n.d.	n.d.	46
67	R3	13.5	n.d.	n.d.	47
70	1A	79.8	666.5	11.6	35
70	1B	184	660.8	16.4	10.1
70	1C	137	523.5	6.77	10
70	1D	153	632.7	4.96	21
70	1E	118	503.3	6.44	10.3
70	1F	102	611.1	10.5	119
70	2A	103	606.3	15.7	32
70	2B	201	635.1	18.6	9.9
70	2C	158	606.1	6.09	10.3
70	2D	181	597.7	9.89	7.5
70	2E	134	510.8	11.3	10
70	2F	124	606.6	11.1	153
70	3A	124	595.5	19.4	10
70	3B	112	578.7	10.2	10.7
70	3C	134	539	6.42	10.7

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
70	3D	146	599.8	5.9	14
70	3E	146	449.6	10	9.5
70	3F	110	557.8	12.1	171
70	4A	89.5	654	11.2	8
70	4B	150	631.2	8.45	10.4
70	4C	159	568.4	5.56	10.2
70	4D	177	618.5	4.33	34.5
70	4E	117	516.9	10.2	10
70	4F	114	600.5	8.4	130
70	5A	148	500	22.7	10
70	5B	248	593.1	13.1	0.4
70	5C	257	535.9	6.86	10.5
70	5D	253	612.4	4.49	46
70	5E	128	521.6	5.82	10.6
70	5F	113	591.9	9.66	144
70	6A	84.2	528.9	16.5	25
70	6B	184	614.1	11.8	10.5
70	6C	195	594.6	5.58	10.1
70	6D	140	592.7	7.07	40
70	6E	114	508	10.9	10.4
70	6F	115	580.9	8.72	144
70	BCAL	72.4	476.2	n.d.	51
70	BDOL	54	481.2	n.d.	47
70	R4	14.8	n.d.	2.37	50
74	1A	94.2	n.d.	n.d.	35.5
74	1B	155	n.d.	n.d.	10.2
74	1C	138	n.d.	n.d.	10
74	1D	153	n.d.	n.d.	20
74	1E	104	n.d.	n.d.	10.5
74	1F	104	n.d.	n.d.	106
74	2A	102	n.d.	n.d.	35
74	2B	188	n.d.	n.d.	10.5
74	2C	139	n.d.	n.d.	10.5
74	2D	189	n.d.	n.d.	5
74	2E	133	n.d.	n.d.	10.5
74	2F	122	n.d.	n.d.	132
74	3A	93.4	n.d.	n.d.	12.5
74	3B	103	n.d.	n.d.	10.7
74	3C	119	n.d.	n.d.	10.7
74	3D	120	n.d.	n.d.	7.5
74	3E	123	n.d.	n.d.	10
74	3F	112	n.d.	n.d.	133

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
74	4A	96.9	n.d.	n.d.	7
74	4B	142	n.d.	n.d.	10
74	4C	148	n.d.	n.d.	10.6
74	4D	172	n.d.	n.d.	39
74	4E	137	n.d.	n.d.	10
74	4F	115	n.d.	n.d.	101
74	5A	121	n.d.	n.d.	10
74	5B	228	n.d.	n.d.	10.5
74	5C	239	n.d.	n.d.	10.1
74	5D	241	n.d.	n.d.	40
74	5E	124	n.d.	n.d.	10.5
74	5F	116	n.d.	n.d.	143
74	6A	101	n.d.	n.d.	15
74	6B	168	n.d.	n.d.	10.3
74	6C	178	n.d.	n.d.	10.4
74	6D	128	n.d.	n.d.	42
74	6E	108	n.d.	n.d.	10.1
74	6F	122	n.d.	n.d.	135
74	BCAL	76	n.d.	n.d.	47.5
74	BDOL	52.4	n.d.	n.d.	45
74	R5	14.9	n.d.	n.d.	48
77	1A	81.6	628.5	12.2	31
77	1B	172	697.6	17.1	10
77	1C	134	554.3	6.58	10.2
77	1D	163	620.7	6.37	12.5
77	1E	102	534.2	5.43	10.4
77	1F	107	602.8	11.7	113
77	2A	103	583.3	16.5	22
77	2B	174	619.4	19	10.3
77	2C	143	544.4	5.87	10
77	2D	198	588.6	8.87	7.5
77	2E	134	521.7	8.56	10.3
77	2F	127	562	11.1	148
77	3A	89.9	578.3	15.6	12.5
77	3B	152	596.2	10.7	10.4
77	3C	113	547.5	6.24	10
77	3D	121	599.4	8.56	7
77	3E	117	583.5	8.48	9.5
77	3F	114	597	10.4	137
77	4A	103	589	n.d.	5
77	4B	130	625.7	8.79	10
77	4C	144	573.5	6.13	10.1

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
77	4D	161	614	2.21	37
77	4E	113	519.9	8.95	10
77	4F	122	605.5	9.81	126
77	5A	108	494.9	26.6	9.5
77	5B	220	597.3	12.3	10.4
77	5C	238	546.2	6.27	10.1
77	5D	245	616.3	4.64	34.5
77	5E	129	543.6	7.7	10
77	5F	119	597.5	6.6	156
77	6A	86.4	538	17	17.5
77	6B	151	602.5	11.9	10.1
77	6C	173	581.6	6.09	10.6
77	6D	129	590.4	3.94	39
77	6E	105	525.8	8.17	10.4
77	6F	122	595	8.4	147
77	BCAL	73.4	477.9	n.d.	48
77	BDOL	47.5	472	n.d.	47
77	R6	13.7	567.9	n.d.	48
82	1A	90.9	n.d.	n.d.	22.5
82	1B	187	n.d.	n.d.	10.1
82	1C	123	n.d.	n.d.	10.2
82	1D	150	n.d.	n.d.	13
82	1E	105	n.d.	n.d.	10.4
82	1F	105	n.d.	n.d.	125
82	2A	110	n.d.	n.d.	29
82	2B	216	n.d.	n.d.	10.5
82	2C	142	n.d.	n.d.	10.1
82	2D	197	n.d.	n.d.	5
82	2E	135	n.d.	n.d.	10
82	2F	124	n.d.	n.d.	142
82	3A	98.3	n.d.	n.d.	14
82	3B	94.7	n.d.	n.d.	10.4
82	3C	103	n.d.	n.d.	10
82	3D	114	n.d.	n.d.	7
82	3E	122	n.d.	n.d.	10.2
82	3F	123	n.d.	n.d.	139
82	4A	86.2	n.d.	n.d.	21
82	4B	137	n.d.	n.d.	10.1
82	4C	139	n.d.	n.d.	10.4
82	4D	160	n.d.	n.d.	18
82	4E	112	n.d.	n.d.	10.2
82	4F	130	n.d.	n.d.	124

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
82	5A	210	n.d.	n.d.	12.5
82	5B	204	n.d.	n.d.	10.4
82	5C	234	n.d.	n.d.	9.9
82	5D	247	n.d.	n.d.	52.5
82	5E	124	n.d.	n.d.	10.5
82	5F	133	n.d.	n.d.	143
82	6A	97.9	n.d.	n.d.	6
82	6B	146	n.d.	n.d.	10.4
82	6C	153	n.d.	n.d.	10
82	6D	126	n.d.	n.d.	35
82	6E	106	n.d.	n.d.	10.5
82	6F	133	n.d.	n.d.	130
82	BCAL	76.7	n.d.	n.d.	45
82	BDOL	55	n.d.	n.d.	42
82	R1	13.5	n.d.	n.d.	45
84	1A	68.9	636.9	16.3	22
84	1B	165	631.5	16.5	10.1
84	1C	136	557.6	6.38	10.5
84	1D	142	610.2	6.84	21
84	1E	106	535.8	7.85	10
84	1F	99.4	585.3	7.62	179
84	2A	94.4	605.6	18.2	27
84	2B	177	614.5	19.2	10.4
84	2C	154	594.6	6.64	10.5
84	2D	183	615.1	11.9	13
84	2E	143	541.1	8.56	10.1
84	2F	128	618.8	10.8	203
84	3A	85.3	595	18.5	12
84	3B	102	606.5	9.8	10.5
84	3C	111	564.9	6.09	10.4
84	3D	125	604	7.38	10
84	3E	122	601.2	11.1	10.2
84	3F	121	614	8.32	171
84	4A	91.7	614.3	11.5	12.5
84	4B	109	628.6	8.54	10.3
84	4C	139	589.3	6.07	10.5
84	4D	153	615.5	2.45	27.5
84	4E	115	524.1	8.56	10.2
84	4F	138	606.5	9.34	161
84	5A	141	483.2	33.4	7.5
84	5B	162	584.1	12.2	10.4
84	5C	225	550.4	6.22	10.2

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
84	5D	233	608.5	4.56	55.5
84	5E	129	550	6.84	10
84	5F	128	597.6	6.52	177
84	6A	88.6	539.3	21.5	14
84	6B	130	600.2	12	10
84	6C	142	583.4	5.98	10.5
84	6D	122	592.7	3.55	47
84	6E	118	537	8.79	10.3
84	6F	135	598.7	8.4	194
84	BCAL	62.9	490	n.d.	55
84	BDOL	50	491.4	n.d.	55
84	R2	13.6	564.5	0.568	50
88	1A	103	n.d.	n.d.	19
88	1B	151	n.d.	n.d.	10.1
88	1C	139	n.d.	n.d.	10.4
88	1D	157	n.d.	n.d.	13
88	1E	120	n.d.	n.d.	10.4
88	1F	108	n.d.	n.d.	105
88	2A	111	n.d.	n.d.	15
88	2B	156	n.d.	n.d.	10.4
88	2C	134	n.d.	n.d.	10.5
88	2D	n.d.	n.d.	n.d.	3
88	2E	147	n.d.	n.d.	10
88	2F	127	n.d.	n.d.	111
88	3A	104	n.d.	n.d.	10
88	3B	102	n.d.	n.d.	10.1
88	3C	105	n.d.	n.d.	10.4
88	3D	n.d.	n.d.	n.d.	3
88	3E	126	n.d.	n.d.	10
88	3F	127	n.d.	n.d.	112
88	4A	101	n.d.	n.d.	5
88	4B	131	n.d.	n.d.	10.2
88	4C	126	n.d.	n.d.	10.3
88	4D	153	n.d.	n.d.	75.5
88	4E	116	n.d.	n.d.	9.9
88	4F	136	n.d.	n.d.	46
88	5A	217	n.d.	n.d.	7
88	5B	171	n.d.	n.d.	10.4
88	5C	196	n.d.	n.d.	10
88	5D	201	n.d.	n.d.	40
88	5E	130	n.d.	n.d.	10
88	5F	137	n.d.	n.d.	111

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
88	6A	87.6	n.d.	n.d.	8
88	6B	136	n.d.	n.d.	10.6
88	6C	144	n.d.	n.d.	10.2
88	6D	117	n.d.	n.d.	35
88	6E	120	n.d.	n.d.	10.3
88	6F	136	n.d.	n.d.	127
88	BCAL	83.7	n.d.	n.d.	45
88	BDOL	46.8	n.d.	n.d.	42.5
88	R3	15	n.d.	n.d.	48
91	1A	177	631.4	13.9	20
91	1B	153	625.5	16.1	9.9
91	1C	139	584.1	6.77	10.4
91	1D	152	608.6	3.23	17.5
91	1E	124	557.1	6.84	10.5
91	1F	119	610.4	8.48	132
91	2A	110	600.1	17.2	21
91	2B	146	615.4	17.7	10.5
91	2C	136	584	6.31	10.6
91	2D	190	584.2	11.8	10
91	2E	158	541.1	8.79	10.5
91	2F	133	613.7	8.48	153
91	3A	90.9	564.3	14.6	14
91	3B	110	595.4	9.82	10.5
91	3C	104	559	6.18	10.5
91	3D	115	563.7	5.35	4.5
91	3E	135	597.1	8.87	10.3
91	3F	132	608.8	12.2	138
91	4A	119	633.6	9.09	22
91	4B	130	621.2	7.97	10.3
91	4C	123	582.6	5.89	10.4
91	4D	136	597.2	4.56	21.5
91	4E	128	524.1	8.01	10.6
91	4F	149	603.7	5.11	109
91	5A	130	470.4	28.9	6
91	5B	171	586.6	13.5	10.5
91	5C	186	556.1	6.58	10.5
91	5D	156	607.8	2.68	50
91	5E	144	546.8	6.05	10.2
91	5F	142	602.3	8.09	138
91	6A	98	511.3	18.5	7.5
91	6B	143	601.3	10.6	10
91	6C	140	583.3	6.2	10.1

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
91	6D	115	589.1	6.37	37
91	6E	115	534.2	9.26	10.4
91	6F	146	606.8	5.82	150
91	BCAL	63.6	486	n.d.	50
91	BDOL	47.9	487.2	n.d.	47
91	R4	14.9	577.6	n.d.	46
95	1A	188	n.d.	n.d.	14
95	1B	157	n.d.	n.d.	10.3
95	1C	136	n.d.	n.d.	10.3
95	1D	167	n.d.	n.d.	15
95	1E	124	n.d.	n.d.	10.5
95	1F	120	n.d.	n.d.	123
95	2A	121	n.d.	n.d.	20
95	2B	143	n.d.	n.d.	10.5
95	2C	147	n.d.	n.d.	10.5
95	2D	n.d.	n.d.	n.d.	4
95	2E	157	n.d.	n.d.	10
95	2F	132	n.d.	n.d.	133
95	3A	96.6	n.d.	n.d.	11
95	3B	110	n.d.	n.d.	10.4
95	3C	113	n.d.	n.d.	10.5
95	3D	123	n.d.	n.d.	5
95	3E	123	n.d.	n.d.	10.3
95	3F	133	n.d.	n.d.	142
95	4A	n.d.	n.d.	n.d.	7.5
95	4B	136	n.d.	n.d.	10.2
95	4C	128	n.d.	n.d.	10.3
95	4D	148	n.d.	n.d.	24
95	4E	130	n.d.	n.d.	10.4
95	4F	149	n.d.	n.d.	104
95	5A	140	n.d.	n.d.	6
95	5B	154	n.d.	n.d.	10.5
95	5C	182	n.d.	n.d.	10.5
95	5D	177	n.d.	n.d.	47
95	5E	135	n.d.	n.d.	10.4
95	5F	145	n.d.	n.d.	125
95	6A	99.3	n.d.	n.d.	6.5
95	6B	147	n.d.	n.d.	10.1
95	6C	141	n.d.	n.d.	10.2
95	6D	115	n.d.	n.d.	34
95	6E	110	n.d.	n.d.	10.5
95	6F	146	n.d.	n.d.	137

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
95	BCAL	70.2	n.d.	n.d.	42
95	BDOL	37.2	n.d.	n.d.	37.5
95	R5	18.5	n.d.	n.d.	47.5
98	1A	148	664.6	16.9	15
98	1B	142	686.2	16.4	10.1
98	1C	137	528.4	5.82	10.5
98	1D	149	646.9	5.82	17.5
98	1E	136	579.3	5.82	10.6
98	1F	125	637	7.7	138
98	2A	103	624.4	16.8	22.5
98	2B	133	594.4	19.4	10.5
98	2C	140	592.1	6.07	10.5
98	2D	163	594.1	11.8	6
98	2E	157	554.1	5.82	10.4
98	2F	133	629.6	9.58	162
98	3A	102	557	16	10
98	3B	102	593.6	9.98	10.3
98	3C	120	574.3	5.43	10.5
98	3D	n.d.	n.d.	n.d.	3
98	3E	122	596.7	8.25	10.1
98	3F	136	613.1	10.8	148
98	4A	130	610.1	9.23	12
98	4B	120	613.6	8.48	10.3
98	4C	122	587	5.71	10.8
98	4D	147	607.9	3.47	25
98	4E	121	534.5	5.58	10.6
98	4F	153	620.5	6.52	148
98	5A	92.3	496.2	25.6	8
98	5B	152	594.7	13.1	10.4
98	5C	169	594.1	5.74	10.6
98	5D	168	608.8	4.02	50
98	5E	144	556.2	5.27	10.6
98	5F	147	612.3	9.26	148
98	6A	102	558.7	14.8	10
98	6B	149	610.5	10.9	10
98	6C	143	586.5	5.82	10.5
98	6D	110	604.3	4.33	34
98	6E	117	536.3	5.82	10.6
98	6F	145	612.9	7.15	151
98	BCAL	72.3	484.5	n.d.	54
98	BDOL	7.6	486.3	n.d.	52
98	R6	14.7	583.7	n.d.	47.5

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
103	1A	163	n.d.	n.d.	16
103	1B	143	n.d.	n.d.	10.3
103	1C	138	n.d.	n.d.	10.5
103	1D	166	n.d.	n.d.	6
103	1E	149	n.d.	n.d.	10.4
103	1F	136	n.d.	n.d.	80
103	2A	113	n.d.	n.d.	20
103	2B	136	n.d.	n.d.	10.4
103	2C	132	n.d.	n.d.	10.5
103	2D	n.d.	n.d.	n.d.	n.d.
103	2E	163	n.d.	n.d.	10.3
103	2F	140	n.d.	n.d.	96
103	3A	98.1	n.d.	n.d.	13
103	3B	118	n.d.	n.d.	10.4
103	3C	125	n.d.	n.d.	10.6
103	3D	n.d.	n.d.	n.d.	n.d.
103	3E	113	n.d.	n.d.	10.3
103	3F	145	n.d.	n.d.	110
103	4A	131	n.d.	n.d.	5
103	4B	127	n.d.	n.d.	10.2
103	4C	122	n.d.	n.d.	10.6
103	4D	136	n.d.	n.d.	15
103	4E	126	n.d.	n.d.	10.5
103	4F	154	n.d.	n.d.	86
103	5A	120	n.d.	n.d.	7.5
103	5B	156	n.d.	n.d.	10.5
103	5C	162	n.d.	n.d.	10.5
103	5D	164	n.d.	n.d.	35
103	5E	139	n.d.	n.d.	10.8
103	5F	152	n.d.	n.d.	104
103	6A	102	n.d.	n.d.	17
103	6B	147	n.d.	n.d.	10.4
103	6C	136	n.d.	n.d.	10.7
103	6D	110	n.d.	n.d.	26
103	6E	114	n.d.	n.d.	10.6
103	6F	152	n.d.	n.d.	121
103	BCAL	79.8	n.d.	n.d.	42
103	BDOL	42	n.d.	n.d.	40
103	R1	17.3	n.d.	n.d.	45
105	1A	149	606.7	17	10
105	1B	127	638.6	15.1	10.3
105	1C	127	593.8	5.6	10.5

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
105	1D	144	626.6	4.33	22
105	1E	139	580	4.96	10.5
105	1F	141	629.1	8.56	181
105	2A	89.7	586.9	17.1	27
105	2B	119	600.3	19.4	10.5
105	2C	127	585.1	6.07	10.5
105	2D	192	578.4	9.26	11
105	2E	158	554.3	5.19	10.4
105	2F	136	608.5	9.89	200
105	3A	105	572.9	14.2	15
105	3B	114	584.1	10.2	10.4
105	3C	123	590.3	5.34	10.5
105	3D	136	586	6.29	13
105	3E	114	600.6	7.7	10.2
105	3F	145	622.4	8.64	164
105	4A	126	638	10.9	9.5
105	4B	112	614.8	8.5	10.4
105	4C	116	574.7	5.78	10.4
105	4D	143	605	5.19	37.5
105	4E	119	534.3	4.17	10.5
105	4F	150	616	6.44	147
105	5A	77.5	471.6	24.3	7.5
105	5B	127	582	12.9	10.4
105	5C	142	556	5.6	10.5
105	5D	152	618.2	4.56	52
105	5E	126	557	4.56	10.6
105	5F	146	609.8	8.64	178
105	6A	78.2	572.7	15.7	17.5
105	6B	139	607.4	10.8	9.8
105	6C	138	580.4	5.78	10.7
105	6D	110	604.2	4.09	40
105	6E	107	543.2	5.19	10.7
105	6F	142	624.5	6.84	175
105	BCAL	68.9	477.2	n.d.	53
105	BDOL	46.7	480.1	n.d.	53
105	R2	13.7	572	0.254	48
109	1A	182	n.d.	n.d.	14.5
109	1B	135	n.d.	n.d.	10.2
109	1C	124	n.d.	n.d.	10.8
109	1D	148	n.d.	n.d.	12
109	1E	145	n.d.	n.d.	10
109	1F	138	n.d.	n.d.	114

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
109	2A	105	n.d.	n.d.	17.5
109	2B	125	n.d.	n.d.	10.4
109	2C	118	n.d.	n.d.	10.7
109	2D	n.d.	n.d.	n.d.	1
109	2E	160	n.d.	n.d.	10.6
109	2F	143	n.d.	n.d.	131
109	3A	76.6	n.d.	n.d.	14.5
109	3B	110	n.d.	n.d.	10.2
109	3C	135	n.d.	n.d.	10.6
109	3D	119	n.d.	n.d.	8
109	3E	119	n.d.	n.d.	10.4
109	3F	150	n.d.	n.d.	125
109	4A	105	n.d.	n.d.	11
109	4B	117	n.d.	n.d.	10.1
109	4C	116	n.d.	n.d.	10.8
109	4D	142	n.d.	n.d.	35.5
109	4E	125	n.d.	n.d.	10.6
109	4F	150	n.d.	n.d.	90
109	5A	143	n.d.	n.d.	5
109	5B	130	n.d.	n.d.	10.4
109	5C	139	n.d.	n.d.	10.5
109	5D	154	n.d.	n.d.	42
109	5E	132	n.d.	n.d.	10.6
109	5F	144	n.d.	n.d.	131
109	6A	74.5	n.d.	n.d.	15
109	6B	136	n.d.	n.d.	10.5
109	6C	133	n.d.	n.d.	10.6
109	6D	116	n.d.	n.d.	30
109	6E	108	n.d.	n.d.	10.5
109	6F	152	n.d.	n.d.	135
109	BCAL	81.6	n.d.	n.d.	45.5
109	BDOL	42.4	n.d.	n.d.	43
109	R3	16.1	n.d.	n.d.	50
112	1A	159	634.9	15.8	9
112	1B	136	623.6	14.6	10.2
112	1C	135	570.2	5.36	10.5
112	1D	144	592.9	5.03	21
112	1E	143	578.3	4.96	10.3
112	1F	143	632.8	7.07	130
112	2A	96.7	543.3	16	20
112	2B	180	605.1	17.1	10.4
112	2C	130	581.1	6.05	10.6

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
112	2D	171	581.9	11.9	5
112	2E	163	554.1	5.58	10.2
112	2F	141	627.6	9.19	154
112	3A	85	537.7	13.8	12
112	3B	123	580.5	9.65	10.5
112	3C	140	599	5.69	10.5
112	3D	n.d.	576.8	6.37	5
112	3E	116	606	6.84	10.4
112	3F	160	626.7	10.7	150
112	4A	98.8	608	8.12	15
112	4B	129	607.3	8.28	10.1
112	4C	117	586.8	5.82	10.6
112	4D	139	610.1	4.96	30
112	4E	129	550.5	4.49	10.5
112	4F	152	634	7.07	128
112	5A	164	500.2	30.2	5
112	5B	125	572.7	12.8	10.4
112	5C	141	563.4	5.52	10.6
112	5D	153	616	3.62	49
112	5E	137	562.3	4.72	10.4
112	5F	144	631.6	8.72	145
112	6A	80.1	565.2	11.6	20
112	6B	134	590.2	10.7	10.7
112	6C	139	584.1	5.4	10.8
112	6D	116	599.7	4.09	35
112	6E	112	556.2	4.17	10.5
112	6F	150	622.9	7.23	146
112	BCAL	77.8	478.1	n.d.	50
112	BDOL	46.3	475	n.d.	47.5
112	R4	17.2	567.5	n.d.	50
116	1A	154	n.d.	n.d.	10
116	1B	128	n.d.	n.d.	9.8
116	1C	132	n.d.	n.d.	10.7
116	1D	147	n.d.	n.d.	17.5
116	1E	149	n.d.	n.d.	10.3
116	1F	138	n.d.	n.d.	108
116	2A	93.1	n.d.	n.d.	22.5
116	2B	131	n.d.	n.d.	10.5
116	2C	126	n.d.	n.d.	10.8
116	2D	n.d.	n.d.	n.d.	1
116	2E	157	n.d.	n.d.	10.4
116	2F	139	n.d.	n.d.	130

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
116	3A	70.2	n.d.	n.d.	15
116	3B	110	n.d.	n.d.	10.5
116	3C	127	n.d.	n.d.	10.6
116	3D	n.d.	n.d.	n.d.	6
116	3E	117	n.d.	n.d.	10.4
116	3F	156	n.d.	n.d.	115
116	4A	67.6	n.d.	n.d.	38
116	4B	133	n.d.	n.d.	10.2
116	4C	117	n.d.	n.d.	10.5
116	4D	133	n.d.	n.d.	29
116	4E	127	n.d.	n.d.	10.5
116	4F	141	n.d.	n.d.	94
116	5A	185	n.d.	n.d.	5
116	5B	128	n.d.	n.d.	10.4
116	5C	125	n.d.	n.d.	10.4
116	5D	135	n.d.	n.d.	39
116	5E	124	n.d.	n.d.	10.8
116	5F	136	n.d.	n.d.	134
116	6A	79	n.d.	n.d.	22
116	6B	127	n.d.	n.d.	10.4
116	6C	124	n.d.	n.d.	10.6
116	6D	104	n.d.	n.d.	32
116	6E	106	n.d.	n.d.	10.7
116	6F	142	n.d.	n.d.	122
116	BCAL	77.1	n.d.	n.d.	44
116	BDOL	46.1	n.d.	n.d.	40
116	R5	14.6	n.d.	n.d.	50
119	1A	58.2	581.5	13.8	7.5
119	1B	66.6	611.3	14.2	10.2
119	1C	57	566.5	5.58	10.6
119	1D	69.1	597.3	4.49	16
119	1E	76	583.2	4.17	10.6
119	1F	71.5	631.1	8.4	137
119	2A	39.5	566.7	15.7	20
119	2B	56.7	573.6	18.4	10.5
119	2C	60.5	n.d.	n.d.	10.5
119	2D	n.d.	n.d.	n.d.	4
119	2E	80.2	556.6	4.8	10.2
119	2F	68.7	627.3	8.32	162
119	3A	33.2	522.2	13.8	13
119	3B	51.4	579.1	10.3	10.4
119	3C	64.8	599.1	5.23	10.8

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
119	3D	56.8	585	6.68	7.5
119	3E	60.1	611.1	6.44	10.3
119	3F	80.9	630.5	8.01	147
119	4A	53	583.6	7.88	14
119	4B	60.2	611	8.17	10.4
119	4C	63.1	589.2	5.49	10.5
119	4D	64.4	607.8	3.7	22
119	4E	63.1	561.2	4.33	10.5
119	4F	70.3	631.9	6.68	145
119	5A	42.5	503.8	22.9	14
119	5B	60.8	575.1	13.2	10.5
119	5C	66.9	558.1	5.6	10.6
119	5D	55	604.3	4.17	28
119	5E	60.8	566.7	3.94	11
119	5F	64.8	630.7	6.76	165
119	6A	29.5	496	18.3	8
119	6B	60.4	596.9	10.8	10.3
119	6C	65.4	581.7	5.71	10.6
119	6D	54.5	600.2	4.96	33
119	6E	51.4	559	4.33	10.5
119	6F	68.5	618.3	7.23	155
119	BCAL	34.5	466.8	n.d.	45
119	BDOL	21.7	474.8	n.d.	45
119	R6	14.5	581.1	0.724	49
123	1A	94.4	n.d.	n.d.	5
123	1B	72.7	n.d.	n.d.	10
123	1C	59.7	n.d.	n.d.	10.6
123	1D	77.5	n.d.	n.d.	22.5
123	1E	77.7	n.d.	n.d.	10.6
123	1F	84	n.d.	n.d.	112
123	2A	47.4	n.d.	n.d.	15
123	2B	90.8	n.d.	n.d.	9.8
123	2C	61.3	n.d.	n.d.	10.5
123	2D	n.d.	n.d.	n.d.	n.d.
123	2E	84.4	n.d.	n.d.	10.6
123	2F	75.9	n.d.	n.d.	154
123	3A	40.7	n.d.	n.d.	10
123	3B	61.4	n.d.	n.d.	10.4
123	3C	75.3	n.d.	n.d.	10.8
123	3D	67.1	n.d.	n.d.	7
123	3E	66.6	n.d.	n.d.	10.3
123	3F	90.9	n.d.	n.d.	165

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
123	4A	37.5	n.d.	n.d.	55
123	4B	66.8	n.d.	n.d.	10.3
123	4C	65.3	n.d.	n.d.	10.6
123	4D	74.8	n.d.	n.d.	24.5
123	4E	70.6	n.d.	n.d.	10.3
123	4F	78	n.d.	n.d.	131
123	5A	n.d.	n.d.	n.d.	1
123	5B	65.1	n.d.	n.d.	10.4
123	5C	68.9	n.d.	n.d.	10.6
123	5D	84.6	n.d.	n.d.	20.5
123	5E	64.1	n.d.	n.d.	10.9
123	5F	68.2	n.d.	n.d.	171
123	6A	35.2	n.d.	n.d.	10
123	6B	66	n.d.	n.d.	10.5
123	6C	68.5	n.d.	n.d.	10.9
123	6D	59.3	n.d.	n.d.	26
123	6E	56.2	n.d.	n.d.	10.7
123	6F	69.6	n.d.	n.d.	164
123	BCAL	37.5	n.d.	n.d.	45
123	BDOL	21.2	n.d.	n.d.	44
123	R1	9.18	n.d.	n.d.	48
126	1A	134	609.3	14.7	7.5
126	1B	75.8	638.5	14.3	10
126	1C	68.7	560.5	5.36	10.5
126	1D	85.5	580.3	5.03	28
126	1E	90.9	560.5	3.15	10.7
126	1F	94.7	610.2	8.09	144
126	2A	45.1	588.4	16.7	22
126	2B	80.4	617.5	17.7	10.4
126	2C	69.3	570.4	5.69	10.9
126	2D	81.2	550.6	12.2	8
126	2E	96.3	572.3	4.64	10.4
126	2F	86.8	610.6	8.79	167
126	3A	41.1	568.9	14	12
126	3B	59.2	585	10.4	10.3
126	3C	79.6	579	5.05	10.4
126	3D	68.7	566	6.13	10
126	3E	74.7	578	5.27	10.2
126	3F	110	609.5	8.09	144
126	4A	37.3	606.3	8.32	7.5
126	4B	70.6	607.9	8.3	10.1
126	4C	82.5	567.2	5.4	11

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
126	4D	77.7	591.5	3.39	27.5
126	4E	77.2	529.5	3	10.4
126	4F	87.1	610.8	5.82	141
126	5A	107	510.2	n.d.	5
126	5B	80.1	563.1	13.3	10.4
126	5C	74.9	546.5	5.4	10.3
126	5D	77.2	592	3.7	32
126	5E	78.6	542.8	3.62	10.5
126	5F	75.1	610.9	6.29	175
126	6A	42.6	546.1	20	12
126	6B	70.3	575.2	10.5	10.5
126	6C	71.2	561.5	5.47	10.9
126	6D	61.7	587.1	5.35	44
126	6E	63.6	539.9	3.55	10.5
126	6F	75.6	611.4	6.37	150
126	BCAL	37.6	487.4	n.d.	46
126	BDOL	24.2	476.7	n.d.	45
126	R2	8.81	569.2	n.d.	50
130	1A	113	n.d.	n.d.	5.5
130	1B	88.1	n.d.	n.d.	9.7
130	1C	77.2	n.d.	n.d.	11.1
130	1D	92	n.d.	n.d.	47
130	1E	88	n.d.	n.d.	10.5
130	1F	97.5	n.d.	n.d.	116
130	2A	77.3	n.d.	n.d.	15
130	2B	175	n.d.	n.d.	10.5
130	2C	73.3	n.d.	n.d.	10.8
130	2D	n.d.	n.d.	n.d.	n.d.
130	2E	96.3	n.d.	n.d.	10.1
130	2F	86.96	n.d.	n.d.	122
130	3A	44.3	n.d.	n.d.	16
130	3B	63.5	n.d.	n.d.	10.4
130	3C	78.6	n.d.	n.d.	10.9
130	3D	92	n.d.	n.d.	5
130	3E	78.8	n.d.	n.d.	10.5
130	3F	113	n.d.	n.d.	145
130	4A	44.3	n.d.	n.d.	15
130	4B	69.7	n.d.	n.d.	10.4
130	4C	70.5	n.d.	n.d.	10.9
130	4D	72.7	n.d.	n.d.	25
130	4E	74.8	n.d.	n.d.	10.6
130	4F	86.1	n.d.	n.d.	111

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
130	5A	n.d.	n.d.	n.d.	1
130	5B	74.1	n.d.	n.d.	10.4
130	5C	75.6	n.d.	n.d.	10.4
130	5D	79.3	n.d.	n.d.	42
130	5E	71.8	n.d.	n.d.	10.5
130	5F	76.7	n.d.	n.d.	157
130	6A	31.2	n.d.	n.d.	15
130	6B	67.8	n.d.	n.d.	10.8
130	6C	68.9	n.d.	n.d.	10.6
130	6D	62	n.d.	n.d.	32.5
130	6E	61	n.d.	n.d.	10.5
130	6F	75.4	n.d.	n.d.	149
130	BCAL	39.6	n.d.	n.d.	44
130	BDOL	23	n.d.	n.d.	41
130	R3	10.7	n.d.	n.d.	50
133	1A	97.2	612	14.4	8
133	1B	77.4	613.3	14.2	15
133	1C	76.6	585	5.94	15
133	1D	94	586	2.53	45
133	1E	88.7	557.6	4.33	15
133	1F	99.2	608.3	6.21	203
133	2A	59.1	604.6	15.1	18
133	2B	123	634.3	16.6	14
133	2C	84	568.8	5.94	15
133	2D	99.1	n.d.	n.d.	7.5
133	2E	100	537.9	5.66	15
133	2F	87.9	610.1	5.9	167
133	3A	36.1	565.8	14.1	13
133	3B	65.6	595.4	9.6	15
133	3C	80.4	585.5	5.69	15
133	3D	83.9	562.7	4.41	9
133	3E	74.7	585.7	6.13	15
133	3F	116	611.8	7.54	160
133	4A	44.5	606.5	9.71	10
133	4B	66	603.4	7.68	15
133	4C	72.8	563.3	5.65	15
133	4D	73	589.2	3.31	26
133	4E	75.5	534.7	4.56	15
133	4F	90.8	610.1	3.47	168
133	5A	n.d.	n.d.	n.d.	5
133	5B	61.7	565.2	13.4	15
133	5C	75.12	545.3	6.16	15

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
133	5D	77.4	592	1.59	45
133	5E	73.3	543.5	4.64	15
133	5F	76.8	608.7	5.9	231
133	6A	29.5	539.1	20.7	12
133	6B	67.3	597.1	9.82	15
133	6C	72	565.5	5.78	15
133	6D	62.3	585.6	3.47	42
133	6E	60.9	541.8	5.5	15
133	6F	73.2	608.5	4.25	174
133	BCAL	40.4	478.5	n.d.	48
133	BDOL	28	477.5	n.d.	47
133	R4	8.06	573.9	n.d.	49
138	1A	105	n.d.	n.d.	5
138	1B	86.3	n.d.	n.d.	10.4
138	1C	7.01	n.d.	n.d.	10.7
138	1D	86.9	n.d.	n.d.	12.5
138	1E	86	n.d.	n.d.	11
138	1F	97.8	n.d.	n.d.	96
138	2A	56.8	n.d.	n.d.	7
138	2B	87.8	n.d.	n.d.	10.5
138	2C	78.8	n.d.	n.d.	11
138	2D	n.d.	n.d.	n.d.	n.d.
138	2E	98.8	n.d.	n.d.	10.5
138	2F	86.6	n.d.	n.d.	97
138	3A	36.1	n.d.	n.d.	7
138	3B	72	n.d.	n.d.	10.2
138	3C	82.7	n.d.	n.d.	11
138	3D	n.d.	n.d.	n.d.	n.d.
138	3E	84	n.d.	n.d.	10.3
138	3F	127	n.d.	n.d.	96
138	4A	45	n.d.	n.d.	5.5
138	4B	67.6	n.d.	n.d.	10.1
138	4C	67.2	n.d.	n.d.	10.6
138	4D	65.9	n.d.	n.d.	9
138	4E	73.9	n.d.	n.d.	10.5
138	4F	87.9	n.d.	n.d.	104
138	5A	38.6	n.d.	n.d.	9.5
138	5B	65.4	n.d.	n.d.	10.4
138	5C	70.6	n.d.	n.d.	10.8
138	5D	70.8	n.d.	n.d.	17
138	5E	65.9	n.d.	n.d.	11
138	5F	72.1	n.d.	n.d.	132

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
138	6A	32.4	n.d.	n.d.	5
138	6B	75.6	n.d.	n.d.	10.5
138	6C	62.1	n.d.	n.d.	10.6
138	6D	59.8	n.d.	n.d.	21
138	6E	57.1	n.d.	n.d.	10.9
138	6F	71.5	n.d.	n.d.	138
138	BCAL	41	n.d.	n.d.	40
138	BDOL	18.9	n.d.	n.d.	35
138	R5	6.58	n.d.	n.d.	50
140	1A	106	n.d.	n.d.	5
140	1B	72.8	648	13.8	10.4
140	1C	72.6	590.8	6.29	11
140	1D	95	621.1	3.86	24
140	1E	87.5	577.3	4.02	10.6
140	1F	102	623.7	5.97	190
140	2A	58.1	612.4	15.3	22
140	2B	77.7	588.3	16.3	10.4
140	2C	74.8	567.7	5.94	10.9
140	2D	106	575.3	12.1	7
140	2E	95.6	547.5	5.9	10.4
140	2F	84	623.8	5.5	205
140	3A	37.2	568	16.3	10
140	3B	66.8	584.2	10	10.4
140	3C	87.2	602.8	5.89	10.8
140	3D	86.9	603	3.39	15
140	3E	90.2	646.9	7.07	10.3
140	3F	127	633.3	7.93	164
140	4A	40.9	603.3	9.07	14
140	4B	63.1	600.5	7.7	10.1
140	4C	69.4	602.8	5.71	10.7
140	4D	70.4	602.5	2.92	32.5
140	4E	73.5	585.3	5.97	10.5
140	4F	89.6	616.6	3.31	160
140	5A	33.6	503.4	24.7	8
140	5B	52.6	579.2	13.5	10.4
140	5C	64.4	586.1	6.13	10.5
140	5D	73.4	603.5	1.51	36
140	5E	69.3	580.3	4.88	10.7
140	5F	74.6	618.4	5.66	208
140	6A	25	540.2	16.8	15
140	6B	71.5	590.3	9.65	9.9
140	6C	64.7	617.7	5.91	10.74

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
140	6D	58.8	596	3.23	43
140	6E	54.5	620.2	6.05	10.5
140	6F	70.2	617.5	4.17	178
140	BCAL	36.9	484.6	n.d.	53
140	BDOL	24.5	477.6	n.d.	52
140	R6	7.48	590.5	n.d.	50
144	1A	n.d.	n.d.	n.d.	4
144	1B	82.1	n.d.	n.d.	10.2
144	1C	69.7	n.d.	n.d.	10.8
144	1D	90.6	n.d.	n.d.	67
144	1E	85.9	n.d.	n.d.	10.3
144	1F	104	n.d.	n.d.	87
144	2A	58.1	n.d.	n.d.	16
144	2B	76.6	n.d.	n.d.	10.3
144	2C	70.4	n.d.	n.d.	10.9
144	2D	n.d.	n.d.	n.d.	1
144	2E	93.3	n.d.	n.d.	10.6
144	2F	85.8	n.d.	n.d.	136
144	3A	42.9	n.d.	n.d.	10
144	3B	63.2	n.d.	n.d.	10.4
144	3C	76	n.d.	n.d.	10.8
144	3D	59.1	n.d.	n.d.	9
144	3E	99.8	n.d.	n.d.	10.2
144	3F	128	n.d.	n.d.	120
144	4A	44.9	n.d.	n.d.	6
144	4B	59.9	n.d.	n.d.	10.3
144	4C	66	n.d.	n.d.	10.6
144	4D	62.6	n.d.	n.d.	19
144	4E	72.6	n.d.	n.d.	10.1
144	4F	88	n.d.	n.d.	121
144	5A	42.7	n.d.	n.d.	12
144	5B	53.4	n.d.	n.d.	10.3
144	5C	62	n.d.	n.d.	10.4
144	5D	72.1	n.d.	n.d.	33
144	5E	68.1	n.d.	n.d.	10.5
144	5F	75.4	n.d.	n.d.	143
144	6A	23.1	n.d.	n.d.	17.5
144	6B	62.6	n.d.	n.d.	9.9
144	6C	68.9	n.d.	n.d.	10.6
144	6D	60.4	n.d.	n.d.	34
144	6E	52.1	n.d.	n.d.	10.5
144	6F	66.6	n.d.	n.d.	157

Table 13: cont

Time (days)	Column # and port location	EC μS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
144	BCAL	34.3	n.d.	n.d.	44
144	BDOL	20.1	n.d.	n.d.	42
144	R1	7.06	n.d.	n.d.	47.5
147	1A	n.d.	n.d.	n.d.	2
147	1B	93.2	600.5	13.4	10.2
147	1C	74.8	592.5	6.29	10.6
147	1D	76.4	609	2.6	25
147	1E	91.6	609.2	5.27	10.5
147	1F	96.6	622.5	6.05	166
147	2A	50.4	569.3	15.1	20
147	2B	72.1	568	16.1	10.4
147	2C	73.8	591.3	6.11	10.7
147	2D	95.8	573.8	12.6	5
147	2E	100	636.6	9.74	10
147	2F	88.1	621.3	6.84	174
147	3A	32.7	527	15.7	9
147	3B	58.8	586.5	9.58	10.3
147	3C	73.8	611	5.71	10.9
147	3D	65.8	590.4	3.47	12.5
147	3E	103	644.1	7.31	10.2
147	3F	122	620.5	7.85	140
147	4A	43.3	610.8	11.5	6
147	4B	60.8	615.6	7.92	10.1
147	4C	68.6	599.6	5.89	10.6
147	4D	53.5	595.3	3.31	22
147	4E	75.7	582.4	5.5	10.5
147	4F	83.4	614.8	3.31	149
147	5A	40.2	503.4	18.5	7.5
147	5B	46.6	575.3	13.7	10.4
147	5C	65.2	581.7	6.29	10.4
147	5D	62.6	589.3	2.13	32
147	5E	68.8	583.5	5.5	10.7
147	5F	79.8	613.9	5.66	183
147	6A	33.2	501.6	18.6	11
147	6B	66.8	583.4	9.67	10.4
147	6C	73.1	616	6	10.6
147	6D	56.6	584.4	3.47	42.5
147	6E	56.2	640.9	6.84	10.5
147	6F	63.4	608.2	4.09	172
147	BCAL	34.2	471.7	n.d.	47
147	BDOL	21.8	478.3	n.d.	47
147	R2	7.79	585.8	n.d.	50

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
151	1A	143	n.d.	n.d.	5
151	1B	98.5	n.d.	n.d.	10.3
151	1C	74.8	n.d.	n.d.	10.5
151	1D	91.7	n.d.	n.d.	105
151	1E	95.6	n.d.	n.d.	11.8
151	1F	108	n.d.	n.d.	44
151	2A	53.7	n.d.	n.d.	17.5
151	2B	70.4	n.d.	n.d.	10.4
151	2C	69.8	n.d.	n.d.	10.5
151	2D	n.d.	n.d.	n.d.	2.5
151	2E	107	n.d.	n.d.	10.1
151	2F	88	n.d.	n.d.	137
151	3A	62.7	n.d.	n.d.	7
151	3B	72.5	n.d.	n.d.	10.6
151	3C	71.3	n.d.	n.d.	10.6
151	3D	80.6	n.d.	n.d.	13
151	3E	107	n.d.	n.d.	10.4
151	3F	138	n.d.	n.d.	131
151	4A	35.9	n.d.	n.d.	15
151	4B	63.7	n.d.	n.d.	10.1
151	4C	66.2	n.d.	n.d.	10.7
151	4D	70.5	n.d.	n.d.	20
151	4E	77	n.d.	n.d.	10.5
151	4F	92.6	n.d.	n.d.	126
151	5A	40.5	n.d.	n.d.	7.5
151	5B	55.3	n.d.	n.d.	10.5
151	5C	65.5	n.d.	n.d.	10.5
151	5D	65.4	n.d.	n.d.	32.5
151	5E	67.2	n.d.	n.d.	10.7
151	5F	74.7	n.d.	n.d.	159
151	6A	25.5	n.d.	n.d.	14
151	6B	65.9	n.d.	n.d.	10.5
151	6C	67.2	n.d.	n.d.	10.5
151	6D	59	n.d.	n.d.	38
151	6E	54.3	n.d.	n.d.	10.4
151	6F	65.6	n.d.	n.d.	162
151	BCAL	38.8	n.d.	n.d.	45
151	BDOL	24.1	n.d.	n.d.	42.5
151	R3	7.81	n.d.	n.d.	47
154	1A	78.4	644.5	n.d.	10
154	1B	90.8	616.4	13.2	15
154	1C	74.2	577.5	5.4	15

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
154	1D	80.9	610.5	3.47	40
154	1E	83.6	594.4	3.86	15
154	1F	96.6	615.4	7.7	123
154	2A	59.7	583.3	15.8	20
154	2B	66.6	581.1	16	15
154	2C	63.4	599.8	5.58	15
154	2D	82.9	570.1	n.d.	8
154	2E	92.1	562.6	5.9	15
154	2F	85.3	642.3	7.23	160
154	3A	46.1	n.d.	n.d.	7.5
154	3B	57	592.6	9.29	15
154	3C	66.8	594.9	5.76	15
154	3D	63.9	600.1	6.13	17.5
154	3E	106	597.6	4.56	11
154	3F	129	629.1	7.78	109
154	4A	34.1	n.d.	n.d.	8
154	4B	56.4	616.8	8.3	15
154	4C	64.9	588	5.21	15
154	4D	52.9	606	4.09	29
154	4E	71.5	558.1	5.19	15
154	4F	82.3	633.2	6.21	139
154	5A	n.d.	n.d.	n.d.	6
154	5B	45.5	573.2	13.9	15
154	5C	54.6	584.5	6.27	15
154	5D	60.8	603	4.41	32.5
154	5E	65.5	596.7	3.15	15
154	5F	73.6	615.4	5.5	182
154	6A	22	548.4	17.2	10
154	6B	60.8	590.8	10.2	15
154	6C	64.9	582	5.32	15
154	6D	54.2	596.2	3.94	40
154	6E	52.8	558.4	6.13	15
154	6F	62.7	627	6.37	180
154	BCAL	41.7	451.9	n.d.	46
154	BDOL	22.1	481.4	n.d.	45
154	R4	7.53	577	0.411	50
172	1A	n.d.	n.d.	n.d.	n.d.
172	1B	n.d.	n.d.	n.d.	1
172	1C	91.7	625.4	5.74	15
172	1D	105	599.2	4.56	17
172	1E	96.1	598.4	3.62	15
172	1F	100	611.7	6.91	133

Table 13: cont

Time (days)	Column # and port location	EC µS/cm	Eh mV	DOC ppm 0.1	Volume ml
		Element, Unit, Detection Limit			
172	2A	n.d.	n.d.	n.d.	n.d.
172	2B	n.d.	n.d.	n.d.	n.d.
172	2C	n.d.	n.d.	n.d.	n.d.
172	2D	n.d.	n.d.	n.d.	n.d.
172	2E	97.8	587.3	2.21	15
172	2F	92	622.1	5.82	177
172	3A	n.d.	n.d.	n.d.	n.d.
172	3B	121	591.2	12.5	12
172	3C	90.8	600.5	5.74	15
172	3D	n.d.	n.d.	n.d.	n.d.
172	3E	116	n.d.	n.d.	9
172	3F	123	620.8	5.03	95
172	4A	n.d.	n.d.	n.d.	n.d.
172	4B	85.1	624.2	8.3	15
172	4C	66.5	596	5.6	15
172	4D	66.4	578.6	n.d.	12.5
172	4E	76.6	589.2	4.8	15
172	4F	78.2	613	3.07	156
172	5A	n.d.	n.d.	n.d.	n.d.
172	5B	n.d.	n.d.	n.d.	1
172	5C	62.1	579.2	5.87	15
172	5D	65.7	571.2	7.93	15
172	5E	70.4	593.8	4.41	15
172	5F	71	608.8	3.23	219
172	6A	n.d.	n.d.	n.d.	n.d.
172	6B	n.d.	n.d.	n.d.	n.d.
172	6C	n.d.	n.d.	n.d.	n.d.
172	6D	n.d.	n.d.	n.d.	n.d.
172	6E	n.d.	n.d.	n.d.	n.d.
172	6F	n.d.	n.d.	n.d.	n.d.
172	BCAL	52.7	464.1	n.d.	38
172	BDOL	34.1	482.4	n.d.	42

Table 14: Total metal concentration of soil matrix material, separated by soil horizon and subhorizons, before and after leaching experiment. All values are in mg/kg dry weight. Samples

Column number and Sample name	Element, Unit, Detection Limit						
	Al mg/kg 1	As mg/kg 0.2	B mg/kg 0.2	Ba mg/kg 0.2	Be mg/kg 0.05	Bi mg/kg 0.3	Ca mg/kg 5
1-LFH-1	51800	80	5.07	253	0.376	12.4	9670
1-LFH-2	47100	112	6.97	239	0.38	15.9	9290
1-AE-1	41500	17	6.74	324	0.408	0.482	7010
1-B1-1	78600	4.3	7.37	363	0.669	<DL	10700
1-B1-2	61500	3.67	7.32	310	0.621	<DL	9310
1-B2-1	59800	2.89	8.09	320	0.621	<DL	9870
1-B2-2	79500	3.38	10.9	381	0.687	<DL	11200
1-C-1	73000	3.21	10	353	0.716	<DL	11100
2-LFH-1	32400	74.6	8.19	184	0.261	10.7	113000
2-LFH-2	74500	99.2	10.9	291	0.421	14	40500
2-AE-1	50600	15.5	11.9	343	0.492	0.373	9060
2-B2-1	109000	3.76	10.2	366	0.598	<DL	11700
2-B2-2	62700	3.59	11.5	322	0.645	<DL	9720
2-B2-1	78900	3.53	15.1	373	0.651	<DL	11200
2-B2-2	69500	2.97	11.7	338	0.675	<DL	10200
2-C-1	88300	3.6	11.9	347	0.687	<DL	15600
3-LFH-1	33300	64.6	9.9	216	0.258	9.66	58400
3-LFH-2	48300	86.7	8.87	217	0.327	12.1	20000
3-AE-1	48600	16.3	14.2	358	0.485	0.426	7600
3-B3-1	45300	4.02	10.9	271	0.604	<DL	6740
3-B3-2	44200	4.54	12	303	0.681	<DL	7410
3-B2-1	78000	3.65	12.7	378	0.627	<DL	11000
3-B2-2	77400	3.26	16.9	369	0.704	<DL	11600
3-C-1	60600	3.71	14.6	314	0.781	<DL	10900
4-LFH-1	60300	81.7	12.1	249	0.348	11.6	11300
4-LFH-2	56800	126	13.3	266	0.408	17.4	10400
4-AE-1	50000	14.2	15	372	0.53	0.367	8500
4-B4-1	67100	4.49	13	346	0.669	<DL	10200
4-B4-2	76200	3.5	14	356	0.698	<DL	10700
4-B2-1	75100	3.29	15.3	370	0.645	<DL	11100
4-B2-2	73300	2.92	13.6	349	0.657	<DL	10700
4-C-1	78300	3.89	16.2	393	0.781	<DL	12400
5-LFH-1	65100	89.7	17	237	0.36	12.6	126000
5-LFH-2	63000	117	17.7	272	0.441	15.5	51700
5-AE-1	60900	15.4	16.9	393	0.472	0.4	9940
5-B5-1	86800	4.27	13	365	0.627	<DL	10900
5-B5-2	70600	4.23	15.8	353	0.657	<DL	11300
5-B2-1	91000	3.41	18	403	0.669	<DL	12300
5-B2-2	81000	3.6	19.8	370	0.698	<DL	11400
5-C-1	65900	3.46	16.7	309	0.829	<DL	12500
Initial LFH	63300	90.9	16.1	304	0.496	9.88	10900
Initial Ae	65600	9.85	15.5	422	0.474	<DL	10100
Initial Bf	71200	3.03	13.2	371	0.633	<DL	11300
Initial BC	76500	3.14	20.3	408	0.775	<DL	11700
Initial C	90400	4.31	20.5	389	0.799	<DL	12100
Residual* Calcite	7740	1	7.1	60.8	0.0417	<DL	392000
Residual Dolomite	<DL	2.75	10.6	<DL	<DL	<DL	246000

<DL under detection limit

*Residual calcite and dolomite collected from blank columns after leaching experiment

Table 14: cont.

Column number and Sample name	Element, Unit, Detection Limit						
	Cd mg/kg 0.05	Ce mg/kg 0.04	Co mg/kg 0.03	Cr mg/kg 0.4	Cs mg/kg 0.03	Cu mg/kg 0.05	Dy mg/kg 0.02
1-LFH-1	3.33	21.9	60.3	42	0.771	1430	1.31
1-LFH-2	3.78	18.4	89.9	58.3	0.907	1610	1.17
1-AE-1	0.512	8.18	4.76	27.7	0.654	159	0.507
1-B1-1	0.502	14.8	11	58.6	0.833	69.8	0.895
1-B1-2	0.512	10.9	10.5	54.9	0.72	57.4	0.678
1-B2-1	0.449	13.6	9.69	55.8	0.725	36	0.845
1-B2-2	0.437	22.4	11.4	59.9	0.843	37	1.48
1-C-1	0.382	19.1	19.3	95.7	0.775	65.7	1.54
2-LFH-1	3.06	23.8	53.3	34.3	0.735	1260	1.16
2-LFH-2	3.55	36.9	76.2	51.7	1.07	1560	2
2-AE-1	0.532	10.5	5.65	35.7	0.764	155	0.557
2-B2-1	0.546	30.1	10.3	54.7	0.923	70.5	1.6
2-B2-2	0.524	12.4	10.7	56.7	0.729	56	0.735
2-B2-1	0.529	19.4	11.3	60.1	0.805	43	1.22
2-B2-2	0.401	14.5	10.3	58.8	0.791	33.9	0.952
2-C-1	0.423	25.4	17.8	108	0.835	59.8	2.07
3-LFH-1	3.28	24.5	47	30.8	0.524	1270	1.19
3-LFH-2	3.12	24	61.6	42.6	0.813	1470	1.17
3-AE-1	0.546	9.24	5.39	34.6	0.797	182	0.559
3-B3-1	0.523	7.36	10.5	56.5	0.613	72.5	0.5
3-B3-2	0.648	6.43	11.4	60.9	0.619	60.9	0.443
3-B2-1	0.518	16	11.3	61.7	0.864	51.9	1.03
3-B2-2	0.462	20.8	14.1	77	0.851	41	1.43
3-C-1	0.394	16.9	19.7	85.3	0.804	65.8	1.16
4-LFH-1	3.15	24.2	59.1	42.9	0.916	1360	1.42
4-LFH-2	4	23.3	93.4	61.1	1.04	1870	1.36
4-AE-1	0.488	9.95	4.97	33.5	0.813	143	0.625
4-B4-1	0.527	11.6	10	54.1	0.821	71.3	0.744
4-B4-2	0.564	13.9	11.4	58.4	0.898	56.8	0.86
4-B2-1	0.545	18.1	11.5	61.3	0.968	46.1	1.09
4-B2-2	0.438	17.3	10.7	56.5	0.865	43.9	1.17
4-C-1	0.501	20.9	21.8	97.8	0.678	70.7	1.61
5-LFH-1	3.25	33.8	62.3	43.8	0.973	1510	1.93
5-LFH-2	3.63	32.9	96	59.2	1.22	1640	1.72
5-AE-1	0.554	12.5	4.87	31.9	0.867	183	0.735
5-B5-1	0.491	16.8	9.95	54.2	0.914	76.2	1.02
5-B5-2	0.579	13.1	12	61.7	0.884	59.2	0.893
5-B2-1	0.492	21.6	11.6	62.4	1.02	46.5	1.32
5-B2-2	0.436	19.8	11.7	63	0.973	43.3	1.27
5-C-1	0.408	17.3	21.7	138	0.598	64	1.36
Initial LFH	2.91	18.4	124	67.8	0.956	1140	1.25
Initial Ae	0.347	14.2	2.39	23.6	0.765	83.6	0.783
Initial Bf	0.498	11.8	10.1	56.1	0.801	42.2	0.772
Initial BC	0.475	18.7	11	66.9	0.967	31.9	1.18
Initial C	0.467	28.8	22	81.9	1.2	88.6	1.88
Residual* Calcite	0.0958	2.88	8.15	2.38	0.112	22.9	0.316
Residual Dolomite	3.14	1.58	0.395	<DL	<DL	3.63	0.19

Table 14: cont.

Column number and Sample name	Element, Unit, Detection Limit						
	Er mg/kg 0.03	Eu mg/kg 0.02	Fe mg/kg 1	Ga mg/kg 0.02	Gd mg/kg 0.05	Ge mg/kg 0.05	Hf mg/kg 0.6
1-LFH-1	0.642	0.43	31600	9.27	1.37	2.67	3.4
1-LFH-2	0.662	0.369	44000	9.07	1.22	3.49	1.83
1-AE-1	0.2	0.248	9670	13	0.97	0.912	4.01
1-B1-1	0.41	0.373	22100	15	1.27	2.15	4.11
1-B1-2	0.291	0.297	20500	13.3	1.03	1.95	3.67
1-B2-1	0.379	0.343	19700	13.7	1.17	2.1	3.86
1-B2-2	0.705	0.543	24000	15.6	1.54	2.45	3.9
1-C-1	0.795	0.523	34700	15.8	1.52	3.09	3.45
2-LFH-1	0.565	0.383	26200	6.69	1.39	1.79	1.02
2-LFH-2	0.956	0.63	40100	11.3	2.09	2.97	1.87
2-AE-1	0.239	0.272	11900	14.1	1.09	1.13	4.24
2-B2-1	0.799	0.615	20900	15	1.8	2.45	3.8
2-B2-2	0.33	0.327	21500	14.1	1.09	2.25	3.93
2-B2-1	0.581	0.504	22300	15.8	1.48	2.4	4.17
2-B2-2	0.404	0.387	20800	14.9	1.23	2.08	3.98
2-C-1	1.01	0.632	33700	15.2	1.82	2.59	3.51
3-LFH-1	0.544	0.4	23100	7.65	1.44	1.64	1.07
3-LFH-2	0.563	0.375	32500	8.41	1.38	2.06	1.55
3-AE-1	0.257	0.256	11800	15	1.12	1.02	4.55
3-B3-1	0.195	0.208	20800	13	0.843	1.72	3.8
3-B3-2	0.174	0.222	22000	13.8	0.891	1.87	4.08
3-B2-1	0.451	0.408	22900	15.9	1.32	2.05	3.86
3-B2-2	0.677	0.511	29100	16.6	1.56	2.64	4.41
3-C-1	0.573	0.422	34200	15.3	1.27	2.84	3.45
4-LFH-1	0.679	0.454	31600	9.53	1.48	2.69	1.62
4-LFH-2	0.689	0.436	49300	10.5	1.48	3.94	2.97
4-AE-1	0.306	0.289	11700	15	1.15	1.13	4.61
4-B4-1	0.316	0.323	20400	14.8	1.11	1.89	3.89
4-B4-2	0.397	0.373	22600	15.2	1.2	2.24	4.04
4-B2-1	0.493	0.44	22600	15.8	1.39	2.36	4.11
4-B2-2	0.481	0.434	20900	14.8	1.39	1.6	3.72
4-C-1	0.779	0.579	39200	17.4	1.7	3.34	3.58
5-LFH-1	0.95	0.591	34400	8.77	1.96	2.25	1.45
5-LFH-2	0.905	0.555	47900	10.9	1.9	3.02	1.78
5-AE-1	0.514	0.353	11300	15.6	1.32	1.01	4.51
5-B5-1	0.504	0.43	20600	15.1	1.36	2.05	3.75
5-B5-2	0.477	0.379	23700	15.4	1.19	2.18	3.83
5-B2-1	0.61	0.521	23400	16.5	1.62	2.19	3.73
5-B2-2	0.689	0.498	23200	16	1.5	2.28	4.02
5-C-1	0.609	0.476	40600	15.3	1.32	3.27	3.28
Initial LFH	0.618	0.436	58800	11.8	1.4	4.46	2.28
Initial Ae	0.406	0.367	7000	15.9	1.39	0.91	4.45
Initial Bf	0.385	0.355	20200	15.6	1.2	2.11	4.15
Initial BC	0.534	0.462	23700	17.6	1.5	2.38	4.91
Initial C	0.866	0.565	35700	17.6	1.78	3.39	4.1
Residual* Calcite	0.129	0.0809	3130	1.64	0.321	0.424	0.92
Residual Dolomite	0.0799	<DL	859	<DL	0.108	<DL	<DL

Table 14: cont.

Column number and Sample name	Element, Unit, Detection Limit						
	Hg mg/kg 1	Ho mg/kg 0.02	In mg/kg 0.02	K mg/kg 6	La mg/kg 0.03	Li mg/kg 0.02	Lu mg/kg 0.03
1-LFH-1	<DL	0.222	0.207	7080	11	2.99	0.122
1-LFH-2	<DL	0.2	0.266	7010	9.28	3.66	0.105
1-AE-1	<DL	0.0804	0.0219	14400	3.86	2.03	<DL
1-B1-1	<DL	0.152	0.0293	15800	5.57	5.62	0.086
1-B1-2	<DL	0.115	0.0255	14500	4.29	4.85	<DL
1-B2-1	<DL	0.141	0.0236	14900	4.75	4.21	0.0788
1-B2-2	<DL	0.263	0.0297	15800	8.43	6.23	0.13
1-C-1	<DL	0.29	0.0398	14600	6.89	7.71	0.167
2-LFH-1	<DL	0.201	0.181	5200	12.8	2.3	0.0896
2-LFH-2	<DL	0.348	0.232	8390	19.4	3.65	0.185
2-AE-1	<DL	0.0964	0.023	15800	4.65	2.59	<DL
2-B2-1	<DL	0.288	0.0263	14800	12.8	5.93	0.161
2-B2-2	<DL	0.131	0.0265	15100	4.99	5.1	<DL
2-B2-1	<DL	0.22	0.0287	16200	7.54	5.98	0.115
2-B2-2	<DL	0.163	0.0269	15800	5.18	5.42	0.0867
2-C-1	<DL	0.369	0.0376	14000	9.64	7.31	0.203
3-LFH-1	<DL	0.201	0.16	5870	13.4	1.82	0.0985
3-LFH-2	<DL	0.211	0.205	6560	11.7	2.68	0.108
3-AE-1	<DL	0.0887	0.0265	16500	4.24	2.47	<DL
3-B3-1	<DL	0.0713	0.0214	14500	2.96	4.17	<DL
3-B3-2	<DL	0.0713	0.0245	14700	2.32	4.16	<DL
3-B2-1	<DL	0.179	0.0239	15900	5.88	5.77	0.0975
3-B2-2	<DL	0.253	0.0309	17200	7.81	5.72	0.13
3-C-1	<DL	0.211	0.0369	15000	5.69	5.42	0.098
4-LFH-1	<DL	0.249	0.189	7440	12.4	3.21	0.124
4-LFH-2	<DL	0.253	0.284	7650	11.8	4.25	0.129
4-AE-1	<DL	0.105	0.0238	16000	4.7	2.79	0.0731
4-B4-1	<DL	0.127	0.0249	15500	4.53	5.16	<DL
4-B4-2	<DL	0.141	0.0274	15900	5.42	5.72	0.0798
4-B2-1	<DL	0.193	0.0275	17200	6.79	5.47	0.0985
4-B2-2	<DL	0.186	0.023	15600	6.22	5.31	0.0927
4-C-1	<DL	0.286	0.0423	15700	7.08	8.12	0.137
5-LFH-1	<DL	0.346	0.208	6440	18.2	3.27	0.168
5-LFH-2	<DL	0.292	0.255	8470	16.7	4.15	0.157
5-AE-1	<DL	0.133	0.0235	16300	5.81	2.92	0.0793
5-B5-1	<DL	0.185	0.0251	15000	6.63	5.98	0.103
5-B5-2	<DL	0.152	0.0307	16000	5.06	5.57	0.0812
5-B2-1	<DL	0.23	0.0259	16500	8	6.54	0.116
5-B2-2	<DL	0.228	0.0259	16700	7.25	5.98	0.12
5-C-1	<DL	0.232	0.0402	14900	6.17	6.23	0.12
Initial LFH	<DL	0.216	0.207	10500	8.65	4.18	0.121
Initial Ae	<DL	0.141	<DL	17000	6.89	2.17	0.0932
Initial Bf	<DL	0.139	0.0266	16200	4.6	5.16	0.0735
Initial BC	<DL	0.203	0.0285	18700	6.63	5.72	0.101
Initial C	<DL	0.327	0.0386	16000	8.6	9.25	0.16
Residual* Calcite	<DL	0.0547	<DL	2620	1.79	0.531	<DL
Residual Dolomite	<DL	<DL	<DL	203	1.08	0.0771	<DL

Table 14: cont.

Column number and Sample name	Element, Unit, Detection Limit						
	Mg mg/kg 0.1	Mn mg/kg 0.02	Mo mg/kg 3	Na mg/kg 1	Nb mg/kg 0.3	Nd mg/kg 0.3	Ni mg/kg 0.2
1-LFH-1	6860	183	4.25	8490	8.89	8.22	1480
1-LFH-2	7860	189	3.99	8260	4.39	6.96	2130
1-AE-1	3360	144	<DL	18300	4.69	3.39	79.8
1-B1-1	8340	226	<DL	22600	5.69	5.37	55.8
1-B1-2	7460	205	<DL	19900	5.08	4	50.8
1-B2-1	8030	215	<DL	20200	4.98	4.69	40.7
1-B2-2	9690	280	<DL	22300	5.42	8	43.5
1-C-1	10900	408	<DL	17600	6.21	6.81	65.6
2-LFH-1	6770	174	<DL	5710	2.28	8.57	1290
2-LFH-2	7810	196	<DL	10300	4.02	13.1	1810
2-AE-1	4560	169	<DL	20600	4.66	4.18	68.1
2-B2-1	8610	219	<DL	21500	4.8	10.5	49.1
2-B2-2	7810	226	<DL	21000	4.97	4.59	49
2-B2-1	9100	260	<DL	24500	5.5	6.86	47
2-B2-2	8170	229	<DL	22100	5.38	5.02	42.6
2-C-1	12900	386	<DL	17500	5.32	9	62.1
3-LFH-1	27700	213	<DL	5120	2.34	9.16	1180
3-LFH-2	15500	187	<DL	7430	2.79	8.2	1510
3-AE-1	4180	164	<DL	21500	4.95	3.82	69.9
3-B3-1	6730	209	<DL	19500	5.32	2.75	49.1
3-B3-2	6820	217	<DL	20200	5.3	2.37	52.7
3-B2-1	8480	248	<DL	22500	5.42	5.65	50.8
3-B2-2	9520	332	<DL	23900	6.54	7.28	46.7
3-C-1	9120	390	<DL	19300	5.99	5.65	56.4
4-LFH-1	8540	203	<DL	8900	2.8	9.08	1430
4-LFH-2	8760	209	3.38	9120	8.07	8.94	2290
4-AE-1	4960	173	<DL	21700	5.77	4.2	50.4
4-B4-1	7950	210	<DL	22600	5.17	4.39	46.3
4-B4-2	8450	233	<DL	23100	5.22	5.02	51.4
4-B2-1	8700	253	<DL	24300	5.36	6.32	49.1
4-B2-2	8370	224	<DL	22300	4.78	6.12	50.5
4-C-1	9360	458	<DL	18900	7	7.55	62
5-LFH-1	8630	205	<DL	7610	2.75	12.5	1550
5-LFH-2	9030	226	<DL	10300	3.67	11.7	2260
5-AE-1	5160	175	<DL	22300	4.81	5.22	55
5-B5-1	8520	221	<DL	22500	4.73	6.37	47.3
5-B5-2	9010	262	<DL	22900	5.28	4.9	52
5-B2-1	9580	262	<DL	24700	5.35	7.75	48.9
5-B2-2	9070	255	<DL	24300	5.38	7.1	47.6
5-C-1	9120	436	<DL	16200	6.28	6.28	63.3
Initial LFH	8590	227	<DL	14800	4.41	7.18	2870
Initial Ae	3650	150	<DL	24100	3.85	5.79	28.1
Initial Bf	8230	220	<DL	25300	4.49	4.43	42.7
Initial BC	9410	272	<DL	27100	5.76	6.51	42.5
Initial C	11400	375	<DL	22500	6.49	8.79	68.4
Residual* Calcite	10000	104	<DL	535	4.62	1.48	35.7
Residual Dolomite	39600	290	<DL	<DL	0.455	0.71	4.38

Table 14: cont.

Column number and Sample name	P mg/kg 1	Pb mg/kg 0.06	Pr mg/kg 0.02	Pt mg/kg 0.05	Rb mg/kg 0.03	Sb mg/kg 0.07	Sc mg/kg 0.2
1-LFH-1	666	223	2.26	0.177	47.8	1.03	9.64
1-LFH-2	747	251	1.88	0.144	46.5	1.24	9.22
1-AE-1	115	19.8	0.893	<DL	71.8	0.305	4.67
1-B1-1	268	11.3	1.4	<DL	71.8	0.158	9.35
1-B1-2	249	10.3	1.05	<DL	58.1	0.136	7.22
1-B2-1	206	10.7	1.2	<DL	62.1	0.128	8.17
1-B2-2	286	11	2.05	<DL	68.2	0.138	12.3
1-C-1	400	10.6	1.75	<DL	53.9	0.141	14
2-LFH-1	638	189	2.43	0.0718	39.4	0.954	5.57
2-LFH-2	788	235	3.71	0.12	60.8	1.17	11.4
2-AE-1	151	18.5	1.13	0.0552	75.7	0.276	5.49
2-B2-1	254	10.4	2.83	<DL	77	0.127	13
2-B2-2	264	10.5	1.19	<DL	57.5	0.145	7.17
2-B2-1	249	12	1.82	<DL	63	0.135	10.6
2-B2-2	218	11.5	1.3	<DL	63.8	0.121	9.19
2-C-1	357	10.5	2.28	<DL	51.3	0.176	16.2
3-LFH-1	567	206	2.58	0.0604	36.5	0.841	5.25
3-LFH-2	633	232	2.31	0.0931	45.3	1.01	7.72
3-AE-1	154	19.5	0.979	0.0546	79.1	0.292	5.07
3-B3-1	259	10.9	0.702	<DL	42.1	0.147	5.15
3-B3-2	278	11.4	0.589	<DL	42.7	0.199	4.78
3-B2-1	259	11.6	1.48	<DL	68.9	0.142	9.69
3-B2-2	354	12.6	1.85	<DL	65.4	0.142	12.3
3-C-1	439	10.9	1.45	0.0605	54.4	0.141	10.5
4-LFH-1	634	199	2.45	0.197	50.7	0.984	9.09
4-LFH-2	862	282	2.39	0.217	50.2	1.36	10.5
4-AE-1	148	17.3	1.09	0.0516	74.7	0.296	5.46
4-B4-1	251	10.8	1.1	<DL	63.1	0.145	7.4
4-B4-2	276	10.8	1.32	<DL	66.5	0.133	8.46
4-B2-1	254	13.8	1.65	<DL	76.6	0.266	9.77
4-B2-2	251	13.8	1.58	<DL	68.5	0.145	9.64
4-C-1	435	11.8	1.9	<DL	54.7	0.164	13.1
5-LFH-1	700	224	3.44	0.1	47.5	1.03	10.3
5-LFH-2	810	243	3.25	0.121	61.7	1.23	10.4
5-AE-1	143	19.3	1.4	<DL	83.5	0.3	6.54
5-B5-1	256	10.4	1.66	<DL	71.7	0.14	10.2
5-B5-2	290	11.1	1.26	<DL	64.3	0.186	9.45
5-B2-1	251	12.3	1.98	<DL	77.7	0.126	11.7
5-B2-2	268	13.8	1.82	<DL	69.6	0.158	11.1
5-C-1	497	10.6	1.59	<DL	49.4	0.18	13.4
Initial LFH	423	152	1.92	0.122	57.3	0.931	9.66
Initial Ae	83.4	14.7	1.57	<DL	85	0.215	5.67
Initial Bf	233	11.4	1.13	<DL	63	0.123	7.9
Initial BC	251	13.1	1.67	0.0522	74.1	0.136	10
Initial C	554	12.4	2.22	<DL	66.3	0.149	12.8
Residual* Calcite	88.7	2.01	0.373	<DL	12.4	0.0977	1.52
Residual Dolomite	26.8	79.1	0.171	<DL	0.846	0.0613	<DL

(Header spanning element columns: Element, Unit, Detection Limit)

Table 14: cont.

Column number and Sample name	Element, Unit, Detection Limit						
	Se mg/kg 0.6	Sm mg/kg 0.03	Sn mg/kg 0.7	Sr mg/kg 0.02	Ta mg/kg 2	Tb mg/kg 0.01	Th mg/kg 0.7
1-LFH-1	14.4	1.63	12.2	157	13.9	0.251	2.91
1-LFH-2	16.2	1.4	14.8	141	4.09	0.228	1.78
1-AE-1	1.86	0.654	1.93	161	2.09	0.0993	0.919
1-B1-1	2.03	1.15	1.64	210	2.36	0.177	1.56
1-B1-2	1.64	0.866	1.45	176	<DL	0.135	1.16
1-B2-1	2.15	1.07	1.93	182	<DL	0.172	1.16
1-B2-2	1.63	1.83	2.06	208	<DL	0.302	1.49
1-C-1	2.07	1.59	2.69	181	<DL	0.312	1.54
2-LFH-1	13.6	1.49	10.3	174	<DL	0.247	1.29
2-LFH-2	16.7	2.64	13.2	190	<DL	0.414	2.39
2-AE-1	1.82	0.838	1.78	176	<DL	0.117	1.06
2-B2-1	2.39	2.21	1.43	228	<DL	0.336	2.37
2-B2-2	2.29	0.973	1.42	180	<DL	0.146	1.32
2-B2-1	2.3	1.52	2	212	<DL	0.247	1.52
2-B2-2	1.09	1.15	2.18	185	<DL	0.193	1.34
2-C-1	0.594	2.04	2.42	193	<DL	0.4	1.41
3-LFH-1	11.5	1.7	9.09	168	<DL	0.257	1.02
3-LFH-2	13.6	1.55	11.5	164	<DL	0.237	1.38
3-AE-1	2	0.733	2.02	170	<DL	0.107	0.968
3-B3-1	1.63	0.541	1.55	139	<DL	0.0934	0.882
3-B3-2	1.06	0.503	1.73	151	<DL	0.0761	0.791
3-B2-1	0.922	1.29	2.02	202	<DL	0.212	1.58
3-B2-2	1.57	1.75	3.28	208	<DL	0.286	1.38
3-C-1	1.33	1.32	2.38	172	<DL	0.218	1.13
4-LFH-1	13.1	1.8	11.4	160	<DL	0.283	1.84
4-LFH-2	20.1	1.82	16.7	156	6.67	0.294	2.3
4-AE-1	1.64	0.827	2.06	180	<DL	0.123	1.19
4-B4-1	1.66	0.937	1.56	197	<DL	0.143	1.24
4-B4-2	1.45	1.04	1.48	197	<DL	0.172	1.3
4-B2-1	2.09	1.33	2.74	208	<DL	0.219	1.44
4-B2-2	<DL	1.4	3.09	194	<DL	0.235	1.34
4-C-1	1.01	1.75	2.96	202	<DL	0.315	1.64
5-LFH-1	13.5	2.5	12.2	194	<DL	0.382	1.98
5-LFH-2	16.4	2.3	15	194	<DL	0.363	1.9
5-AE-1	0.728	1.04	2	190	<DL	0.151	1.28
5-B5-1	0.649	1.35	1.46	208	<DL	0.209	1.66
5-B5-2	<DL	1.08	1.71	200	<DL	0.18	1.37
5-B2-1	1.36	1.63	2.56	233	<DL	0.275	1.68
5-B2-2	<DL	1.61	3.45	206	<DL	0.28	1.55
5-C-1	0.751	1.51	2.78	177	<DL	0.254	1.02
Initial LFH	8.73	1.53	13	194	<DL	0.251	1.48
Initial Ae	1.43	1.14	3.43	204	<DL	0.152	1.39
Initial Bf	1.13	0.995	2.92	206	<DL	0.154	1.31
Initial BC	0.994	1.4	3.03	212	<DL	0.23	1.66
Initial C	1.42	2.09	3.16	206	<DL	0.36	1.33
Residual* Calcite	<DL	0.266	1.56	223	6.57	0.0574	<DL
Residual Dolomite	<DL	0.0813	2.58	103	<DL	0.0299	<DL

Table 14: cont.

Column number and Sample name	Element, Unit, Detection Limit						
	Ti mg/kg 1	Tl mg/kg 0.06	Tm mg/kg 0.03	U mg/kg 0.06	V mg/kg 0.2	W mg/kg 0.2	Y mg/kg 0.02
1-LFH-1	1600	0.411	0.0484	0.71	33.9	2.38	8.01
1-LFH-2	1930	0.554	0.0442	0.785	42.7	3.65	7.53
1-AE-1	2510	0.267	<DL	0.809	35.9	0.809	2.56
1-B1-1	2780	0.289	0.032	0.989	60	0.812	4.28
1-B1-2	2580	0.229	<DL	0.908	56.8	0.615	3.22
1-B2-1	2650	0.244	<DL	0.962	56.7	0.637	3.93
1-B2-2	2970	0.268	0.0524	0.989	71.4	1.14	6.9
1-C-1	4060	0.288	0.0622	1.21	99.5	1.05	8.07
2-LFH-1	1200	0.364	0.0421	1.04	28.2	1.09	7.39
2-LFH-2	1900	0.478	0.073	0.917	41.7	1.56	13.3
2-AE-1	2700	0.285	<DL	0.899	40.9	0.495	3.09
2-B2-1	2750	0.222	0.0631	0.971	57.2	0.424	9.07
2-B2-2	2720	0.231	<DL	0.935	58.3	0.453	3.6
2-B2-1	2780	0.278	0.044	1.08	63.9	0.55	5.66
2-B2-2	2760	0.234	0.0343	1.03	61.2	0.491	4.47
2-C-1	3660	0.221	0.0772	1.12	101	0.563	10.4
3-LFH-1	1290	0.314	0.0361	0.76	28.7	0.956	6.74
3-LFH-2	1590	0.363	0.0421	0.752	33.2	1.06	8.23
3-AE-1	2790	0.288	<DL	0.944	41.1	0.438	2.76
3-B3-1	2750	0.228	<DL	0.953	59.3	0.329	2.27
3-B3-2	2760	0.313	<DL	0.989	61.8	0.358	1.83
3-B2-1	2820	0.211	0.036	1.03	61	0.378	4.68
3-B2-2	3290	0.274	0.0535	1.12	83.9	0.455	7.31
3-C-1	3820	0.262	0.0447	1.15	94.5	0.839	5.93
4-LFH-1	1650	0.348	0.0484	0.704	34.1	0.909	9.67
4-LFH-2	1930	0.533	0.054	0.88	44.8	2.02	8.72
4-AE-1	2770	0.28	<DL	0.935	40.3	0.649	3.36
4-B4-1	2790	0.228	<DL	0.926	56	0.483	3.57
4-B4-2	2790	0.243	0.0316	0.989	61	0.489	4.22
4-B2-1	2890	0.264	0.0404	1.07	63.9	0.448	5.47
4-B2-2	2700	0.231	0.0419	1.01	58.2	0.365	5.06
4-C-1	4670	0.256	0.0595	1.18	108	0.836	7.61
5-LFH-1	1540	0.409	0.0665	1.13	34.8	1.04	12.6
5-LFH-2	1980	0.504	0.0583	1.05	45.8	1.36	11.5
5-AE-1	2750	0.239	<DL	0.917	39.8	0.368	3.84
5-B5-1	2730	0.191	0.0402	0.926	56.2	0.255	4.9
5-B5-2	2850	0.235	0.0318	0.989	65.1	0.459	4.36
5-B2-1	2970	0.213	0.0476	0.989	63.9	0.381	6.31
5-B2-2	2890	0.259	0.0489	1.08	64.5	0.575	5.88
5-C-1	4840	0.225	0.0476	1.12	118	1.27	6.66
Initial LFH	2180	0.4	0.0474	0.779	48.3	0.978	7.15
Initial Ae	2440	0.254	0.0326	0.908	28.5	0.278	4.36
Initial Bf	2740	0.203	<DL	0.926	55.3	0.293	3.9
Initial BC	3090	0.274	0.0425	1.22	67.6	0.435	5.5
Initial C	3850	0.262	0.0654	1.26	85.1	0.799	7.88
Residual* Calcite	86.5	<DL	<DL	1.95	4.54	0.531	2.95
Residual Dolomite	4.35	<DL	<DL	0.816	1.16	<DL	2.16

Table 14: cont.

Column number and Sample name	Element, Unit, Detection Limit		
	Yb mg/kg 0.02	Zn mg/kg 0.06	Zr mg/kg 0.06
1-LFH-1	0.829	103	76.2
1-LFH-2	0.721	115	72.8
1-AE-1	0.377	17.7	178
1-B1-1	0.615	41.3	179
1-B1-2	0.473	42.6	159
1-B2-1	0.601	33.9	167
1-B2-2	0.972	41.5	169
1-C-1	1.05	57.1	156
2-LFH-1	0.701	93.6	43.8
2-LFH-2	1.25	109	85.1
2-AE-1	0.426	24.6	191
2-B2-1	1.05	43	166
2-B2-2	0.48	43	171
2-B2-1	0.815	41.6	175
2-B2-2	0.645	35.3	174
2-C-1	1.34	54.8	156
3-LFH-1	0.679	286	44.6
3-LFH-2	0.751	107	67
3-AE-1	0.404	21.9	199
3-B3-1	0.332	42.6	166
3-B3-2	0.293	44.3	175
3-B2-1	0.667	41.1	169
3-B2-2	0.965	44.8	193
3-C-1	0.724	52.4	150
4-LFH-1	0.903	108	72.9
4-LFH-2	0.93	123	80.5
4-AE-1	0.475	21.3	201
4-B4-1	0.495	38.2	170
4-B4-2	0.578	47.4	174
4-B2-1	0.77	41.1	176
4-B2-2	0.684	34.7	160
4-C-1	1.01	63	154
5-LFH-1	1.17	106	62.9
5-LFH-2	1.14	115	77
5-AE-1	0.546	20.9	199
5-B5-1	0.694	41.2	165
5-B5-2	0.625	68.6	167
5-B2-1	0.859	41.5	167
5-B2-2	0.829	40	173
5-C-1	0.81	57.6	145
Initial LFH	0.79	108	105
Initial Ae	0.652	14.9	195
Initial Bf	0.539	38.3	188
Initial BC	0.775	39.6	211
Initial C	1.19	55.1	182
Residual* Calcite	0.164	43.7	3.54
Residual Dolomite	0.106	801	<DL

Table 15: Bioavailable metal concentration of soil matrix material, separated by soil horizons and subhorizons, before and after leaching experiment. All values are in mg/kg or µg/kg dry weight.

Column number and Sample name	Al	As	B	Ba	Ca	Cd	Co	Cr
Element, Unit, Detection Limit	mg/kg	µg/kg	µg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg
	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
1-LFH-1	24	1140	116	3000	159	161	849	91.3
1-LFH-2	13.7	702	116	1640	77.5	92.5	438	58.7
1-AE-1	5.69	35.7	<DL	534	11.2	14	83.8	17.3
1-B1-1	4.88	3.51	<DL	2380	7.4	16.2	107	8.6
1-B1-2	2.06	6.6	<DL	3380	16	25.6	238	7.67
1-B2-1	1.86	4.36	<DL	3100	9.89	10.9	159	6.92
1-B2-2	1.92	2.98	<DL	3130	13	11.9	182	6.16
1-C-1	5.15	4.59	<DL	3320	11.2	11.5	351	7.33
2-LFH-1	10.1	339	65.8	846	935	4.53	85.4	89.5
2-LFH-2	11.1	333	<DL	759	808	3.07	82.9	90.7
2-AE-1	5.03	28.1	<DL	531	30	11.4	73.7	19.7
2-B2-1	3.26	4.88	<DL	2690	16.6	21.2	156	8.95
2-B2-2	1.04	3.57	<DL	2980	16.2	15.5	198	6.86
2-B2-1	1.45	4.76	<DL	2990	18.5	19.6	204	7.09
2-B2-2	1.43	4.35	<DL	3030	7.44	9.31	172	5.78
2-C-1	4.95	2.81	<DL	3040	11.2	7.61	308	6.69
3-LFH-1	16.2	472	19.9	521	283	6.9	86.5	101
3-LFH-2	12.5	379	<DL	394	211	5.16	81.2	78.5
3-AE-1	7.14	39.4	<DL	419	14.6	8.58	69.7	23.3
3-B3-1	2.25	5.07	<DL	2450	15.1	18.1	163	9.53
3-B3-2	1.48	3.99	<DL	3100	17	20.7	240	7.09
3-B2-1	1.08	4.22	<DL	2740	13.2	13.7	202	6.34
3-B2-2	4.48	3.85	<DL	3400	6.42	9.55	161	6.22
3-C-1	4.93	4.24	<DL	3000	9.61	7.42	352	5.93
4-LFH-1	16.2	405	55.5	691	194	16.7	171	87.2
4-LFH-2	15.4	796	28.5	1710	85.7	89.9	457	61
4-AE-1	3.6	12.9	<DL	792	9.4	13	78.8	7.73
4-B4-1	4.59	4.49	<DL	2500	8.14	15.3	114	7.09
4-B4-2	1.74	4.15	2.53	3290	15.1	20.9	235	5.63
4-B2-1	2.29	4.52	0.71	3790	13.4	18.6	243	4.65
4-B2-2	3.52	1.97	<DL	3530	8.24	11.5	211	3.85
4-C-1	3.58	2.02	<DL	3000	10.1	9.56	354	3.41
5-LFH-1	13.2	389	26.9	655	823	2.95	73	87.2
5-LFH-2	10.1	343	<DL	696	880	2.79	76.2	78.5
5-AE-1	7.88	37.9	<DL	380	36.2	7.4	51.1	22.7
5-B5-1	2.36	5.78	2.99	2550	20.7	18.4	141	7.09
5-B5-2	1.41	6.34	<DL	2890	23.9	19.4	196	6.4
5-B2-1	1.06	4.35	<DL	3090	23.1	15	194	4.21
5-B2-2	2.74	1.04	<DL	3460	13.2	11.7	199	4.85
5-C-1	3.74	1.64	<DL	2860	15.6	8.52	341	3.83
Initial LFH	76.8	1700	232	2450	163	166	982	260
Initial Ae	12.9	59.9	9.91	622	17.1	16.8	222	33.7
Initial Bf	9.28	16.7	<DL	3420	8.29	23.9	201	22.8
Initial BC	8.28	6.2	<DL	3240	8.22	9.32	180	13.3
Initial C	7.94	8.8	76.1	2520	13.6	8.89	424	1.33

<DL under detection limit

Table 15: cont.

Column number and Sample name	Element, Unit, Detection Limit							
	Cu	Fe	Hg	K	Mg	Mn	Mo	Na
	µg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg
	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
1-LFH-1	12400	34.3	<DL	93.5	46.6	18.7	3.84	11.5
1-LFH-2	8330	22.5	<DL	45.5	23.3	8.76	<DL	4.26
1-AE-1	1660	4.22	<DL	9.39	3.56	2.22	<DL	1.4
1-B1-1	614	0.831	<DL	8.44	1.72	0.92	<DL	1.03
1-B1-2	231	1.27	<DL	11.9	4.69	3.22	<DL	1.17
1-B2-1	107	1.33	<DL	12	3.94	2.43	<DL	1.83
1-B2-2	143	1.42	<DL	13.2	6.51	3.74	<DL	1.77
1-C-1	266	0.708	<DL	12	4.67	4.77	<DL	3.08
2-LFH-1	3480	26	<DL	59.8	38.3	1.59	93.9	9.38
2-LFH-2	2930	25.6	<DL	38.7	27.2	1.46	107	6.79
2-AE-1	982	4.32	<DL	9.21	3.75	1.56	<DL	1.29
2-B2-1	420	0.983	<DL	9.55	2.54	1.68	<DL	0.787
2-B2-2	90.1	0.969	<DL	15.8	6.94	4.06	<DL	2.19
2-B2-1	152	0.889	<DL	12	4.54	3.45	<DL	1.12
2-B2-2	72.7	1.51	<DL	13.9	3.43	2.24	<DL	1.64
2-C-1	196	1.18	<DL	10	2.98	3.77	<DL	1.95
3-LFH-1	6350	47.7	<DL	51.5	324	1.31	41.4	6.95
3-LFH-2	4330	34.1	<DL	32.9	260	1.27	34.9	6.23
3-AE-1	1120	6.36	<DL	8.02	11.4	1.41	<DL	1.41
3-B3-1	311	0.626	<DL	9.48	9.52	1.89	<DL	1.12
3-B3-2	160	0.367	<DL	11.2	10.4	3.31	<DL	1.03
3-B2-1	103	0.515	<DL	13.7	10	3.68	1.92	1.83
3-B2-2	166	1.39	<DL	11.4	4.99	1.65	<DL	1.4
3-C-1	179	0.766	<DL	11.8	7.92	4.48	<DL	2.06
4-LFH-1	5610	35.6	<DL	75.1	222	4.78	8.03	12.8
4-LFH-2	9010	25	<DL	59.5	31.1	9.76	<DL	5.68
4-AE-1	1580	0.799	<DL	9.42	3.08	1.58	<DL	1.4
4-B4-1	616	0.47	<DL	9.01	2.14	1.02	<DL	0.929
4-B4-2	168	0.492	<DL	13.2	5.28	3.68	<DL	1.64
4-B2-1	132	0.798	<DL	13.9	5.17	3.66	<DL	2
4-B2-2	135	1.52	<DL	10.8	2.81	2.18	<DL	1.27
4-C-1	145	0.406	<DL	12.2	4.92	4.86	<DL	2.76
5-LFH-1	3880	30.9	<DL	38	32.9	0.995	107	8.34
5-LFH-2	2830	22.9	<DL	34.9	29.7	1.6	119	6.61
5-AE-1	796	6.6	<DL	7.98	3.69	1.01	<DL	1.43
5-B5-1	326	0.171	<DL	9.35	2.82	1.26	<DL	1.22
5-B5-2	156	0.298	<DL	11.2	4.42	2.43	<DL	2.32
5-B2-1	83.1	0.552	<DL	12.5	6.59	3.6	<DL	2.22
5-B2-2	123	1.23	<DL	11.5	3.89	2.34	<DL	4.4
5-C-1	142	0.808	<DL	11.8	4.09	4.36	<DL	2.45
Initial LFH	37300	155	<DL	276	64	20	12	19.2
Initial Ae	7130	16.8	<DL	11.6	6.37	8.97	<DL	4.61
Initial Bf	323	10.8	<DL	8.98	3.4	1.67	<DL	5.16
Initial BC	143	4.76	<DL	5.8	2.75	1.69	<DL	4.67
Initial C	145	4.05	<DL	10.7	8.35	6.35	<DL	7.83

<DL under detection limit

Table 15: cont.

Column number and Sample name	Element, Unit, Detection Limit							
	Ni	P	Pb	Rb	Sb	Se	Sn	Sr
	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
1-LFH-1	23600	2780	497	176	4.51	82	19.1	1280
1-LFH-2	13500	2280	284	121	2.28	56.1	15.1	656
1-AE-1	1990	<DL	14.9	26.9	<DL	5.08	0.7	100
1-B1-1	1560	<DL	1.02	23.3	<DL	<DL	<DL	75.9
1-B1-2	2770	<DL	0.933	36	<DL	<DL	<DL	173
1-B2-1	972	<DL	1.31	44.8	<DL	<DL	<DL	121
1-B2-2	937	<DL	1.39	51.8	<DL	4.61	<DL	146
1-C-1	1240	<DL	1.5	59.3	<DL	1.86	0.636	115
2-LFH-1	2060	2760	355	84.5	4.26	111	18	1260
2-LFH-2	1680	3330	312	79.6	5.46	93.2	19.7	1040
2-AE-1	1710	<DL	10.6	23.9	<DL	3.51	0.375	113
2-B2-1	2420	<DL	0.777	24.3	<DL	<DL	<DL	117
2-B2-2	1190	<DL	0.896	55.2	<DL	5.75	<DL	162
2-B2-1	1900	<DL	0.917	37.5	<DL	0.989	<DL	161
2-B2-2	702	<DL	0.636	61	<DL	<DL	<DL	102
2-C-1	595	<DL	1.83	51.5	<DL	<DL	<DL	80.4
3-LFH-1	2950	3370	686	80.5	6.09	154	26.3	1490
3-LFH-2	2230	2940	426	63.6	4.34	94.6	21.3	916
3-AE-1	1480	<DL	17	25.8	<DL	6.46	1.36	93.5
3-B3-1	2320	<DL	0.936	25	<DL	2.1	<DL	122
3-B3-2	2200	<DL	0.88	36.8	<DL	<DL	<DL	158
3-B2-1	1190	<DL	1.32	50.7	<DL	<DL	<DL	140
3-B2-2	722	<DL	1.53	51.6	<DL	2.94	<DL	83.1
3-C-1	566	<DL	1.46	57.6	<DL	<DL	<DL	82.9
4-LFH-1	4580	2990	333	112	4.52	113	23.1	568
4-LFH-2	13600	2550	304	139	2.17	86.5	10.8	687
4-AE-1	1770	<DL	4.29	24.4	<DL	0.174	<DL	83.1
4-B4-1	1780	<DL	1.24	27.3	<DL	<DL	<DL	85.4
4-B4-2	2310	<DL	1.06	43.8	<DL	<DL	<DL	163
4-B2-1	1850	<DL	2.58	47.2	<DL	<DL	<DL	157
4-B2-2	1100	<DL	2.04	40.4	<DL	<DL	<DL	111
4-C-1	1010	<DL	1.2	47.3	<DL	<DL	<DL	106
5-LFH-1	1710	3200	489	74.4	6.07	118	21.1	1050
5-LFH-2	1560	3650	313	68.5	5.58	106	12.7	1070
5-AE-1	1130	51	15.3	24	<DL	2.95	1.08	89.8
5-B5-1	2220	<DL	0.499	26.8	<DL	<DL	<DL	117
5-B5-2	2360	<DL	1.39	34.9	<DL	<DL	<DL	157
5-B2-1	1200	<DL	1.12	47.7	<DL	<DL	<DL	170
5-B2-2	968	<DL	2.18	47.5	<DL	<DL	<DL	119
5-C-1	767	<DL	0.797	48.4	<DL	<DL	<DL	97.6
Initial LFH	28800	22500	788	427	18.9	482	17.7	1200
Initial Ae	3600	842	15.6	33.6	1.75	23	0.579	146
Initial Bf	1840	<DL	1.29	35.1	<DL	<DL	<DL	102
Initial BC	833	<DL	1.64	29.9	<DL	<DL	<DL	107
Initial C	1120	643	1.59	38.6	<DL	<DL	<DL	151

<DL under detection limit

Table 15: cont.

Column number and Sample name	Element, Unit, Detection Limit				
	Ti	Tl	V	Zn	Zr
	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
	0.001	0.001	0.001	0.001	0.001
1-LFH-1	1950	5.2	82.9	6390	52.1
1-LFH-2	1090	3.42	49.7	2900	28.1
1-AE-1	680	0.311	17.1	579	10.7
1-B1-1	37	0.148	<DL	1340	2.39
1-B1-2	46.7	0.317	<DL	1870	1.73
1-B2-1	40.3	0.303	<DL	909	1.45
1-B2-2	46.6	0.303	<DL	819	1.45
1-C-1	60.8	0.366	<DL	820	1.7
2-LFH-1	1390	0.873	61.1	240	34.7
2-LFH-2	1630	0.35	67.2	159	42.6
2-AE-1	641	0.203	16.1	506	9.79
2-B2-1	61	0.211	0.129	1710	2.24
2-B2-2	56.9	0.371	<DL	1070	1.64
2-B2-1	59.5	0.284	<DL	1510	1.96
2-B2-2	59.4	0.345	<DL	702	1.44
2-C-1	66.8	0.164	<DL	636	1.63
3-LFH-1	2350	0.94	89.5	664	57
3-LFH-2	2000	0.798	69.6	400	42.5
3-AE-1	1100	0.109	26.3	489	16.7
3-B3-1	89.8	0.124	<DL	1640	2.54
3-B3-2	81.1	0.289	<DL	1660	1.81
3-B2-1	7.66	0.64	<DL	1050	1.64
3-B2-2	30.7	0.531	<DL	771	1.67
3-C-1	25.8	0.302	<DL	617	1.78
4-LFH-1	1990	1.63	80.5	963	50.9
4-LFH-2	1080	3.63	50.5	3090	36.5
4-AE-1	62.9	0.149	0.294	659	3.85
4-B4-1	25.3	0.167	<DL	1360	2.36
4-B4-2	23.9	0.407	<DL	1790	1.83
4-B2-1	25.8	0.269	<DL	1440	1.88
4-B2-2	17.6	0.109	<DL	870	1.72
4-C-1	24.1	0.152	<DL	703	1.45
5-LFH-1	1520	0.54	66	207	40.7
5-LFH-2	1120	<DL	54.7	107	42.8
5-AE-1	1130	0.123	29.1	403	15.9
5-B5-1	43.1	0.0994	<DL	1600	1.96
5-B5-2	44	0.253	<DL	1790	2.1
5-B2-1	40.3	0.35	<DL	1110	1.28
5-B2-2	39.8	0.152	<DL	927	1.48
5-C-1	43.3	0.0535	<DL	597	1.44
Initial LFH	971	7.48	193	4870	189
Initial Ae	627	0.395	23.7	2640	20.5
Initial Bf	49.6	0.0835	<DL	1460	6.36
Initial BC	75.7	<DL	<DL	681	3.28
Initial C	41.5	0.0181	<DL	397	2.42

<DL under detection limit

Table 16: C,N,S and moisture content of soil matrix material before and after leaching experiment. All values are in % dry weight. Samples analysed by Thermal combustion.

Column number and Sample name	Moisture content %	Air dry (%) Carbon %	Air dry (%) Nitrogen %	Air dry (%) Sulphur %	Oven dry (%) Carbon %	Oven dry (%) Nitrogen %	Oven dry (%) Sulphur %
1-LFH-1	4.21	23.29	0.823	0.151	24.3	1.12	0.16
1-LFH-2	4.79	24.43	0.938	0.159	25.6	1.28	0.17
1-AE-1	0.45	1.29	0.085	0.011	1.3	0.11	0.01
1-B1-1	1.38	1.27	0.085	0.023	1.3	0.11	0.02
1-B1-2	1.39	0.34	0.092	0.023	1.4	0.12	0.02
1-B2-1	1.01	0.89	0.069	0.019	0.9	0.09	0.02
1-B2-2	0.96	0.87	0.069	0.023	0.9	0.09	0.02
1-C-1	0.97	0.94	0.069	0.025	0.9	0.09	0.03
2-LFH-1	4.1	29.49	1.015	0.139	30.7	1.37	0.14
2-LFH-2	4.28	30.13	0.969	0.141	31.4	1.37	0.15
2-AE-1	0.51	1.38	0.092	0.01	1.4	0.12	0.01
2-B2-1	1.37	1.33	0.085	0.021	1.3	0.11	0.02
2-B2-2	1.38	1.24	0.085	0.021	1.3	0.11	0.02
2-B2-1	1.1	1	0.077	0.02	1	0.1	0.02
2-B2-2	0.91	0.67	0.054	0.017	0.7	0.07	0.02
2-C-1	0.93	0.71	0.046	0.024	0.7	0.06	0.02
3-LFH-1	3.79	15.6	0.523	0.113	16.2	0.71	0.13
3-LFH-2	3.82	29.94	1.023	0.147	31.1	1.38	0.15
3-AE-1	0.49	1.56	0.069	0.012	1.6	0.09	0.01
3-B3-1	1.23	1.87	0.1	0.022	1.9	0.13	0.02
3-B3-2	1.3	1.67	0.085	0.022	1.7	0.11	0.02
3-B2-1	1.07	1.36	0.069	0.019	1.4	0.09	0.02
3-B2-2	0.85	0.99	0.054	0.023	1	0.07	0.02
3-C-1	0.85	0.85	0.046	0.023	0.9	0.06	0.02
4-LFH-1	3.98	27.48	0.908	0.121	28.6	1.23	0.13
4-LFH-2	4.76	23.1	1.085	0.155	33.5	1.48	0.16
4-AE-1	0.5	1.36	0.077	0.011	1.4	0.1	0.01
4-B4-1	1.16	1.44	0.085	0.022	1.5	0.11	0.02
4-B4-2	1.11	1.57	0.092	0.022	1.6	0.12	0.02
4-B2-1	0.89	0.9	0.062	0.019	0.9	0.08	0.02
4-B2-2	0.91	0.88	0.062	0.022	0.9	0.08	0.02
4-C-1	0.86	0.83	0.046	0.023	0.8	0.06	0.02
5-LFH-1	3.44	23.49	0.823	0.114	24.3	1.11	0.12
5-LFH-2	4.32	23.12	1.115	0.164	33.5	1.51	0.17
5-AE-1	0.44	1.57	0.085	0.011	1.6	0.11	0.01
5-B5-1	1.21	2.02	0.1	0.024	2	0.13	0.02
5-B5-2	1.25	1.71	0.092	0.025	1.7	0.12	0.03
5-B2-1	0.91	1.12	0.069	0.02	1.1	0.09	0.02
5-B2-2	0.82	0.99	0.062	0.02	1	0.08	0.02
5-C-1	0.83	0.77	0.038	0.02	0.8	0.05	0.02
Initial LFH	5.57	35.13	1.238	0.166	37.1	1.7	0.18
Initial Ae	0.3	1.37	0.077	0.008	1.4	0.1	0.01
Initial Bf	1.38	1.43	0.085	0.026	1.4	0.11	0.03
Initial BC	0.95	0.85	0.054	0.02	0.9	0.07	0.02
Initial C	0.84	0.5	0.023	0.011	0.5	0.03	0.01

Table 17: pH, conductivity (EC) and oxidation/reduction potential (EH) of soil matrix before and after soil mesocosm experiment.

Column number and Sample name	pH H_2O	pH 0.01M $CaCl_2$	EC µS/cm	Eh mV
1-LFH-1	3.48	3.1	197	553
1-LFH-2	3.67	3.01	105	548
1-AE-1	4.07	3.7	66.1	531
1-B1-1	4.51	4.18	47.6	513
1-B1-2	4.72	4.41	35	495
1-B2-1	4.73	4.51	31.6	495
1-B2-2	4.9	4.44	25	504
1-C-1	4.56	4.51	58.8	542
2-LFH-1	5.54	5.41	243	464
2-LFH-2	4.46	4.33	310	457
2-AE-1	4.35	4.11	75.3	539
2-B2-1	4.74	4.44	49	521
2-B2-2	4.81	4.62	47.8	508
2-B2-1	5.19	4.61	41.6	511
2-B2-2	5.12	4.6	22.1	518
2-C-1	4.86	4.55	40.9	543
3-LFH-1	5.21	5.41	196	442
3-LFH-2	4.87	4.88	141	474
3-AE-1	4.71	4.13	28.2	518
3-B3-1	5.29	4.58	27.2	513
3-B3-2	4.95	4.56	34.5	511
3-B2-1	4.93	4.6	28.5	517
3-B2-2	4.98	4.53	51.3	526
3-C-1	4.73	4.51	48	559
4-LFH-1	3.92	3.81	206	532
4-LFH-2	3.71	3.02	94.3	565
4-AE-1	4.14	3.91	33	544
4-B4-1	4.63	4.28	23.9	533
4-B4-2	4.88	4.43	30.5	513
4-B2-1	4.71	4.5	36.2	522
4-B2-2	4.65	4.46	50.4	526
4-C-1	4.63	4.47	37.4	557
5-LFH-1	5.88	5.79	168	449
5-LFH-2	4.71	4.79	224	464
5-AE-1	4.5	4.12	81.2	541
5-B5-1	4.85	4.5	25	519
5-B5-2	5.08	4.59	27.2	511
5-B2-1	5.05	4.58	39.4	508
5-B2-2	4.72	4.58	45.4	516
5-C-1	4.66	4.58	27.5	545
Initial LFH	3.72	3.3	86.4	528
Initial Ae	4.26	3.85	25.2	546
Initial Bf	4.75	4.22	15.7	517
Initial BC	4.76	4.3	15.2	523
Initial C	4.56	4.34	11.3	529